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FACTS AND OBSERVATIONS

CONCERNING THE

PREVENTION AND CURE

OF

SCARLET FEVER;

WITH

SOME REMARKS

ON THE

ORIGIN OF ACUTE CONTAGIONS IN GENERAL.

BY

WILLIAM BLACKBURNE, M.D.

" Let the ſuppreſſion of Contagion be added to the great works of " wiſdom, of genius, and philanthropy, which diſtinguiſh the pre- " ſent enlightened era, and which have ſo greatly contributed to the " ſecurity and happineſs, as well as the dignity of mankind."——
STANGER'S REMARKS.

LONDON:

PRINTED FOR J. JOHNSON, IN ST. PAUL'S CHURCH-YARD; CADELL AND DAVIES, STRAND; AND R. H. EVANS, PALL-MALL:
BY BYE AND LAW, ST. JOHN'S SQUARE, CLERKENWELL.

1803.

TO

Sir George Onesiphorus Paul, Baronet.

SIR,

In selecting one whose name might with peculiar propriety be prefixed to a publication, that has for it's object the diminution of human suffering, both judgment and inclination have concurred in directing me to you. It is natural that private connection should have some weight with a writer in the dedication of his labours, and would in itself be a sufficient reason for my presenting you with this sincere, but inconsiderable testimony of my regard: but there is yet another motive. It is known, Sir, that with equal liberality and success, you have yourself contributed to the extir-

pation of that species of calamity, which forms the principal subject of the following pages; and if I do not flatter myself too much in hoping that these observations may, in some measure, tend to second your generous efforts for the public good, I am justified in wishing that they should go forth to the world under the sanction of a patronage, calculated to extend their usefulness to society, by ensuring them more general notice.

I have the honour to be,

with great esteem,

your most obedient servant,

Henrietta Street,
Cavendish Square,
Sept. 19, 1803.

THE AUTHOR.

INTRODUCTION.

SCARLET FEVER has conſtituted a very particular object of my attention during the laſt ſixteen years. Every ſeaſon in each, has afforded me numerous detached inſtances of this diſorder.

But the two years preceding the preſent, have yielded more frequent occaſions of obſerving collectively it's nature and progreſs, and of remarking the facility, or rather the negligence and inattention, which *give facility* to it's propaga-

tion. Still it is to be deeply regretted, that although the public have been already admoniſhed to guard againſt it's pernicious conſequences, no proportionate caution has been generally practiſed. Hence it appears, that *repeated* warnings are required, to make an efficient and univerſal impreſſion in any degree adequate to the high importance of the ſubject. There is no doubt, that the occurrence of ſcarlet fever is increaſing, not as a prevailing epidemic contagion, which reigns only during certain periods in particular diſtricts, many examples of which are recorded in the Annals of Medicine, but as an infectious diſeaſe, exiſting in every ſeaſon, kept alive, and in conſtant activity, by the thoughtleſs communications of ſocial intercourſe.

For this reaſon I conceive it to be my duty to communicate what information I have

I have acquired, particularly with regard to the means of checking it's progreſs; and, to enforce the neceſſity of attempting it's total extinction, of which, as a ſpecific contagion, it is completely capable. From theſe motives, the following reſult of my experience is made public.

But it appears alſo, that the method of curing the ſcarlet fever is not ſo conſiſtent, or perfectly eſtabliſhed, as the nature of *ſuch* a diſorder demands. So weighty and numerous are the exceptions to the general laws and precepts of medicine, when applied to individual caſes, and ſo pernicious has been the indiſcriminate adoption of preciſe rules in particular morbid affections, that the utmoſt caution is required in delivering them. Under this impreſſion, a *General Outline only of the Treatment of*

Scarlet Fever is here preſented, ready to be filled up with deeper or lighter ſhades, according to the more acute perception and ſuperior judgment of future obſervers.

The hiſtory of it's ſymptoms has been ſo faithfully executed by Dr. Withering, in his Treatiſe on Scarlet Fever, and by the late venerable Dr. Heberden, in his Commentaries, that it would be ſuperfluous to detail them here.

By ſome ſtrange overſight, Dr. Withering's Eſſay had not been read, or Dr. Heberden's valuable work conſulted, till theſe Remarks were nearly finiſhed. This circumſtance is not ſtated for the purpoſe of claiming credit for originality in the concluſions hereafter deduced, in ſeveral of which I have not the honour to agree with theſe reſpectable authors.

But

But it is perhaps of ſome advantage to the promotion of medical ſcience, that ſeveral individuals, who have cloſely attended to the ſame diſeaſe, have *ſeparately* formed the ſame judgment concerning it in ſeveral important points. That ſuch is the fact in the preſent inſtance, appears from the ſubjoined paſſage, and from Dr. Heberden's and my own opinion, cited in page 40, 41.

" From the moſt aſſiduous attention" (ſays Dr. Withering) " to the ſubject ſince " 1778, &c., I am *now* perſuaded, that " ſcarlatina anginoſa, and the angina " gangrenoſa, conſtitute but one ſpecies " of diſeaſe; that they owe their exiſtence " to one ſpecific contagion." P. 5.

Whether Dr. W. carried his opinion ſo far as to conſider ſcarlatina ſimplex, and angina gangrenoſa, as the ſame ſpecies

of diſeaſe, the reader will collect from his treatiſe.

Mature reflection upon the nature and origin of one contagious diſeaſe, and the laws and modes by which it is communicated, naturally drew my attention towards the ſources of all acute infections. It appeared from this inveſtigation, that ſo ſtrong an analogy pervaded the whole claſs, reſpecting their generation, and the methods by which they were multiplied or diminiſhed, that a plan for extinguiſhing their whole race ſeemed as obvious and practicable as their partial deſtruction.

Dr. Clarke has indeed publiſhed certain very uſeful "Summary Remarks on "the Means of exterminating Typhous "Fever, Scarlet Fever, and the Small "Pox." Collection of Papers, vol. ii,

p. 138. But it is proper to obſerve, that the meritorious labours and writings of thoſe, who are zealouſly promoting the extinction of theſe three contagions, cannot be crowned with complete ſucceſs, unleſs the plan of extinction ſhall be made to comprehend every acute contagion. The ſame ſort of receiving houſes as are deſcribed by Dr. Clarke* for the prevention of ſcarlet fever, will be equally uſeful in reſtraining the progreſs of thoſe frequent infantile diſeaſes, MEASLES and HOOPING COUGH. This great end may be the more eaſily effected, becauſe the hints and ſuggeſtions contained in Dr. Clarke's Collection, and Dr. Stanger's Remarks, will eaſily admit of amplification; and a plan might be contrived, by a committee appointed for that purpoſe, which ſhould

* Page 139, Collection.

extend

extend to every part of the united kingdom. Hooping cough may not, perhaps, with ſtrict propriety, be ranked among *acute* contagions, yet it is propagated in a manner ſimilar to them, and being merely a local affection in it's commencement, would admit even of a more ready extinction than they. The benefit of prophylactic meaſures ought, therefore, undoubtedly, to be alſo extended to the ſuppreſſion of this very diſtreſſing, and often fatal complaint. When I have collected a ſufficient number of caſes, I am not without hopes of being able to propoſe a more expeditious and effectual cure for hooping cough, than I have yet met with.

The ſubſequent pages were ſo far completed, that their publication had been announced, when a very intereſting and uſeful diſcuſſion (edited and enriched by Dr.

Dr. Clarke, of Newcaſtle) concerning the limits of typhous contagion, was recommended to my attention. Hence the appearance of theſe ſheets has been delayed, and ſubjected to reviſal, it is hoped, with no ſmall improvement; as the opinions contained in them are, in ſeveral reſpects, confirmed by the beſt authorities, and important facts again brought forward, the *reiterated* promulgation of which will, it is preſumed, probably be productive of great benefit to ſociety. Moreover, the propoſal in favour of *univerſal* prevention will ſeem to be leſs objectionable, and be rendered more familiar from the various *particular* inſtances of it's prompt and ſucceſsful execution, exhibited in the abovementioned collection.

Viewed through the medium in which the ſubject is about to be here exhibited, the

the extermination of acute contagions, at all times of great importance, aſſumes a higher degree of conſequence in the preſent ſituation of this country. Armies are peculiarly liable to the malignant operation of febrile infection. Our brave and gallant countrymen are at this moment ſummoned to the field, in defence of their native ſoil, with all it's nobleſt and moſt endearing attachments. They will not be able, without extreme caution, to avoid expoſure to thoſe diſeaſes; the cauſe and prevention of which are, in the courſe of the ſubſequent ſheets, ſtrongly pointed out, where one chief object is that of attempting to protect them from ſuch baneful influence.

May the ſucceſs of the author's endeavours correſpond with the ardour of his wiſhes, and the ſincerity of his intentions! On the candour of the public he muſt rely

rely for the excuſe of every imperfection contained in theſe pages; written, as they have been, at thoſe ſhort intervals of time, which he has ſtolen from repoſe, or deducted from recreation.

ERRATA.

In locis. — *Paludal* for *paludous.*
———— *Antes* for *Antis.*
P. 58. —— Comma after *ſucceeded.*

ON

ON

SCARLET FEVER.

PART I.

Scarlet Fever, or Angina Contagiosa, is allowed by all who have observed it's progress, or have written upon the subject, to be highly infectious. The two authors, who have most recently noted this disease, assert it even to be more fatal, more virulent, and more contagious than typhus fever. This appears from the following quotations. "Besides the infection of "continued fever, another contagion of a "specific nature, though more rarely pre- "valent, has occasioned much more propor- "tional mortality. This is the *Scarlet Fever*, "*attended with ulcerated sore throat.*

"The contagion of this fever, when virulent, "is much more to be dreaded than that of proper "fever, because it is more readily disseminated." P. 28. Dr. Clarke. "I can venture to assert, that "these two diseases, small-pox and scarlet fever, "have been more fatal, and have spread more "by contagion than typhus fever in its most "malignant form ever did in the same space of "time." Dr. Wood, p. 139. Collection of

papers by Dr. Clarke. Daily experience ſtrongly confirms theſe facts. But notwithſtanding this conviction, and the alarm which it's preſence occaſions, when admitted into private families or public inſtitutions, yet no adequate meaſures are generally adopted, either to inſure it's excluſion, or reſtrain it's progreſs when unhappily introduced. A period of more than twenty years has elapſed ſince Dr. Haygarth has determined, with equal ability and preciſion, how very circumſcribed the limits of typhus and variolous contagions are, and has clearly proved with what facility the influence of theſe contagions may be repreſſed. He has applied the ſame doctrine, and a ſimilar practice, to ſuppreſs the contagion of ſcarlet fever with ſimilar ſucceſs; a moſt ſtriking proof of which he recites, in page 80 &c. of his Letter to Dr. Percival, and immediately ſubjoins a moſt impreſſive inſtance of the diffuſibility of the ſame diſeaſe, when permitted to take its courſe uncontrolled.

The ſuperior utility of prevention, here contraſted with the total neglect of it's ſalutary regulations, appears in ſo ſtrong a light, that I ſhall quote the whole paſſage, in the hope that it's repetition may at length effectually and univerſally excite the attention of the public, and induce individuals of every deſcription, to adopt the means of warding off a calamity thus ſubjected to their immediate control. " In April

'1779, Maſter Plumbe, the ſon of a gentle-
" man of fortune, near Liverpool, was attacked
" in a dangerous degree with a ſcarlet fever and
" ſore throat, in the houſe of his ſchoolmaſter,
" the Rev. Mr. Vanbrugh, at Cheſter. There
" were at this time, thirty-ſeven young gentle-
" men, boarders in this family, moſt of whom,
" it is highly probable, were diſpoſed to receive
" this dangerous contagion. My patient's cham-
" ber was ſituated in the middle of the houſe,
" at the landing of the firſt pair of ſtairs. All
" the ſcholars went cloſe paſt this door ſeveral
" times a day. At this ſeaſon, Wincheſter, and
" ſeveral other large ſchools in England, ſent
" home and diſperſed their ſcholars, on account
" of this diſtemper, which had alarmingly ſpread
" among them. Whether this meaſure, with
" all it's inconveniences, was not adviſable,
" became a ſerious queſtion. The numerous
" facts which I had then collected, to prove
" that the variolous infection, though probably
" the moſt virulent we are acquainted with in
" this climate, exerted it's baneful influence
" but to a ſmall diſtance only from the poiſon,
" encouraged me to hope that the contagion of
" ſcarlet fever was incapable of producing more
" extenſive miſchief. The rules of prevention
" were placed on the door of the patient's cham-
" ber, and rigid attention to their faithful
" obſervance was required. The event fully

" juſtified my hopes. Though all the thirty-
" ſeven ſcholars remained in the ſame houſe and
" family during the whole diſeaſe, yet not one
" of them was infected.

" I do not recollect any obſervations recorded
" by authors, to determine what proportion of
" mankind are liable to the attack of ſcarlet
" fever. In October 1778, out of forty young
" ladies, at a boarding ſchool at Cheſter, all but
" four had the diſtemper, twelve very ſeverely,
" and two moſt dangerouſly. This comparative
" ſtatement of facts ſhows, beyond all reaſon-
" able doubt, to what a little diſtance from the
" poiſon the infectious miaſms extend, and that
" the rules of prevention are, in this reſpect,
" fully adequate to their purpoſe." Dr. Hay-
" garth's Letter, p. 81 and 82 *.

Theſe prominent and momentous facts have not, however, produced the effect which might have been juſtly expected; proper meaſures of precaution are ſtill too generally neglected; the majority of public inſtitutions, and almoſt all our large families, continue ſtill unprovided for the incidents of ſickneſs, and the ſudden occurrence of infectious diſeaſe. Children of both

* Dr. Haygarth's obſervations, both with reſpect to typhous, variolous, and anginous contagion, have been confirmed by a body of evidence, as complete and ſatisfactory as can be produced on ſuch a ſubject. This will be found in Dr. Clarke's Collection of Papers, &c. Newcaſtle. 1802.

ſexes,

ſexes, and adult females, being moſt liable, by a very great proportion, to ſcarlet fever, ſeminaries of learning, for both ſexes, are too commonly viſited by it.

As ſymptoms of indiſpoſition do not immediately reſult from infection in a general way, no examination takes place with reſpect to the number of thoſe who have been tainted when ſcarlet fever ſhows itſelf in a ſeminary; but as ſoon as the diſeaſe appears in one or more of the children, all are immediately diſperſed. Thoſe in whom the infection is latent, and to be afterwards produced, convey it to their reſpective families, where it ſeizes a leſs or a greater number of the individuals compoſing each family, particularly children and ſervants. By means of the latter, it is chiefly propagated through the circle of their acquaintance, and introduced into other families, and the diſeaſe is thus diffuſed through ſociety without check or reſerve. When the alarm is given in a numerous private family, a ſimilar courſe is too often purſued; the members of it are uſually ſent away, inconſiderately, among friends and acquaintance, and often to ſchool, before it can be diſcovered whether the ſeeds of diſeaſe are not already ſown in ſome of the fugitives. Several may even be infected from the ſame origin, in each of whom the diſorder may appear at different intervals of time. But a very frequent, and almoſt unſuſ-

pected ſource of infection, ariſes from the return of convaleſcents reſuming the ordinary intercourſe with the members of their family, *before* they have *ceaſed* to *diſſeminate contagion.* The preciſe time, in which the breath of a perſon who has paſſed through an infectious diſeaſe becomes incapable of conveying contagion, is by no means determined. The public are not ſufficiently on their guard, with reſpect to this important fact. If the diſeaſe do not actually appear on the infected, they are apt to conclude, that a perſon in apparent good health cannot communicate diſeaſe. A very different concluſion will be drawn from the accounts I am about to recite in the ſequel. And I feel it my duty moſt earneſtly to recommend the utmoſt precaution and vigilance on theſe momentous points, univerſally, to the conductors of education and the heads of families. All maſters and miſtreſſes of boarding ſeminaries ought, for their own ſake, to be provided with one or more ſeparate apartments, in proportion to the ſize of their eſtabliſhment, for the reception of invalides. Theſe ought to be ſo contrived, that the communication between the ſick rooms and the reſt of the houſe may be eaſily, completely, and ſpeedily cut off at any time. If the eſtabliſhment be too contracted to admit of ſuch appendages under the ſame roof, a lodging ſhould always be kept in view in the neighbourhood;

hood; the owner of which, being inſtructed in the methods of preventing the ſpread of contagion, and ſuitably rewarded, might have apartments in readineſs whenever occaſion demanded. There are few inſtitutions, however humble, which may not practiſe this ſimple mode of prevention; and none ought to be ſufferéd, which do not fairly and fully comply with it. Theſe regulations become daily more momentous, in the vicinity of London eſpecially, as the great increaſe of the population, and the extenſion of it's buildings, render public ſeminaries beyond the precincts of it's impure atmoſphere abſolutely eſſential to the preſervation of the riſing generation. When ſcarlet fever manifeſts itſelf in one ſubject, the firſt precaution is to ſeparate that ſubject from the reſt without delay. The next very eſſential one is, to ſubdue unneceſſary alarm and exceſſive fear; for as this diſeaſe is not communicable till the ſecond or third day after it's admiſſion into any conſtitution, and previous or preſent fever almoſt always exiſts when it is admitted; and if it be made a general rule in all ſchools, to ſeparate febrile patients of every deſcription, according to Dr. Haygarth's recommendation; there will be time ſufficient to appriſe the children's friends of the accident, and to adopt that plan, which ſhall moſt readily and moſt certainly extinguiſh the infection in the ſeminary, and alſo moſt effectually prevent it's diffuſion among

ſociety at large. In the performance of this great and indiſpenſable duty, the parent and guardian muſt cooperate fully with the inſtructor; the intereſts, as well as the ſatisfaction of both, are deeply implicated in it's due execution, and both will be amply rewarded for their mutual and beſt exertions by the moſt beneficial reſult.

Where the ſcholars are numerous, and the extent and diſpoſition of the premiſes admit of it, the beſt plan, both for parents, teachers, and the public, is *not* to diſperſe the ſchool*. Having aſcertained and cut off the ſource of infection; having ſeparated the originally tainted, as ſoon as they begin to ſicken, and

* "In many of our large ſchools throughout the kingdom, "ſuch diſtempers have frequently produced dreadful effects; "in ſome inſtances, the ſcholars have been permitted to "aſſociate together till the infection had ſpread to a fatal "extent; in others, they have been ſent home, not only to "the great detriment of their education, but ſo as to occa- "ſion much danger and alarm, by conveying the diſtemper "among their own relations." Haygarth's Letter, p. 78, 79.

"I could here adduce many fatal inſtances of contagion "having been carried home by taking young perſons of both "ſexes from boarding ſchools, on infection breaking out in "them. The practice of diſmiſſing a ſchool (which is ſo "uſual in ſuch caſes) is moſt dangerous, for it very generally "ſpreads the diſeaſe extenſively." Clarke's Collection, p. 66.

while

while they yet remain incapable of imparting diſeaſe; having diſpoſed of them in proper apartments, and ſtrictly inforced the rules of prevention; the evil may be cruſhed in it's infancy. The extent and magnitude of the miſchief will thus be accurately meaſured, and totally obviated. But if the accommodations of the eſtabliſhment be too limited for the complete execution of this ſcheme, or parents be unwilling to commit their offspring to any other than their own inſpection, in the time of illneſs, it is a ſacred duty impoſed on them, not to admit even a ſuſpected child, much leſs a diſeaſed or infected one, into family intercourſe with themſelves, their other children, or their ſervants. A ſeparate apartment, with ſuitable furniture, where circumſtances allow of ſuch conveniences, ought to be always in readineſs, or in a ſtate to be made ready on the ſhorteſt notice, for accidental ſickneſs. Here a ſtrict quarantine ought to be performed, whether the ſubject be ſuſpected or convaleſcent, the period of which may be regulated, partly by what is already known on the ſubject, and finally determined by future obſervation and the reſult of aggregated facts, which hitherto have not been ſought after with that zeal and diligence which their great importance demands. If the child be really infected, immediate ſeparation, with the regimen

eſſen-

eſſentially requiſite to inſure prevention, ought to be practiſed with the utmoſt ſtrictneſs and preciſion. The rules of prevention being of difficult execution in large private families having numerous attendants, and the multiplication of the chances of ſpreading infection by removing young perſons from ſchool to their own home, are ſtrong reaſons why they ſhould remain at ſchool. One great mean of propagating contagion by theſe removals is the cuſtom of conveying infected perſons in public vehicles, ſtage-coaches, &c. This error, though committed daily, proceeds more from inattention and ignorance than any other motive: but when the impropriety and miſchief of ſuch a practice, and it's highly pernicious conſequences are univerſally known and publiſhed, every individual ought conſcientiouſly to abſtain from theſe modes of imparting diſeaſe; and this reſolution being once undeviatingly acted upon, public confidence would be fully eſtabliſhed, all exceſſive alarms on the ſcore of infection might ſafely ſubſide, and even reaſonable precaution might become leſs troubleſome, and eventually be rendered unneceſſary.

Having thought it incumbent on me to premiſe theſe injunctions, I ſhall now proceed, briefly to relate the proceedings which took place in a large private family in London, and the

ſteps

ſteps which were taken in a reſpectable ſeminary near this city, in conſequence of the ſcarlet fever having ſhown itſelf reſpectively in each.

Progreſs of the Diſeaſe in Mr. W.'s Family.

Miſs Maria, W. æt. 4 *(a)*, was ſeized with ſcarlet fever, March the 9th, 1802. The eruption appeared firſt on one hand and arm, and quitting this, deſcended to the lower extremities, not beginning, as is uſual, in the face, and ſpreading ſucceſſively downwards to the lower extremities. Sloughs and ulceration appeared in her tonſils. She was convaleſcent on the 16th. As ſoon as this young lady was ſeized, and after ſhe became convaleſcent, ſhe was ſeparated from all the family, and was ſent to Paddington on March the 23d, in perfect health, with new clothes of every deſcription. She was even then not allowed to aſſociate with her elder ſiſters, who had reſided there for ſome time, and certainly did not infect them. Anne, the nurſery maid, *(b)*, ſhowed ſymptoms of incipient fever the 11th of March, uſed antipyrexial means, and recovered her health; but on the 19th of March was ſeized with the full form of the diſeaſe, both eruption and angina being preſent. She was convaleſcent, and went home into the country on the 29th.

(a) See the following table.

Maſter

Maſter Martin W. *(c)*, æt. 11, was attacked March the 13th; and had a very ſevere diſeaſe. The ulcerations were not confined to the tonſils—deglutition was very painful, though not ſo to his ſiſter, whoſe tonſils alone were affected—the uvula, and upper part of the pharynx, were the ſeat of ſloughs, &c.—and the larynx appeared to ſhare in the complaint from attendant cough and hoarſeneſs.—The eruption covered his whole body in ſucceſſion—he had likewiſe ſlight delirium. Convaleſcence commenced on March the 28th, and after repeated ablutions, and with new clothing, he went April the 4th, to Paddington. From ſome deviation from the rules of prevention between him and his younger brother and ſiſter, a freſh era of contagion moſt probably originated.

Miſs Ann W. æt. 1½ year *(d)*, returned to town, April the 8th, from Paddington, whither ſhe had been ſent, April the 1ſt, with her brother William. She had conſiderable fever.—The eruption appeared in patches in different parts of her body. Tongue foul—but no affectionof the throat, as far as could be judged without having an opportunity to ſee it. She was convaleſcent in three or four days. Her bowels were diſordered, and ſhe was purged with calomel with very good effect.

The cook *(e)*, who was very deſirous to conceal her indiſpoſition, was diſcovered, April the 8th, to have conſiderable ulceration in the tonſils,

fils, with flight fever, head-ach, languor, and a foul tongue; but no eruption. Being of a lively difpofition and a ftrong conftitution, fhe was confined to her chamber, and not to her bed. The throat did not heal in feven or eight days. She went to Ramfgate May the 7th.

The houfemaid *(f)* was obliged to take to her bed, labouring under fevere angina maligna—but *had no eruption.* During the two fucceeding days, fhe appeared to be finking rapidly. The effort of fwallowing was dreadful—her pulfe intermitted —fhe had *fubfultus tendinum et fumma debilitas.* Her recovery, for two or three days almoft totally defpaired of, was effected with the utmoft difficulty, and certainly could not have been accomplifhed with a lefs conftant or lefs bountiful fupply of the beft wine and beft nourifhment, which could be procured. She was convalefcent on the 19th of April, and went home into the country on the 21ft. This fervant became languid and feverifh, with head-ach and lofs of appetite, between the 10th and 12th of March; had no ulceration or eruption at that time; made ufe of the antipyrexial means, and in the courfe of two or three days returned to her bufinefs apparently well. She has fince acknowledged, that in her laft attack, fhe felt as if nothing could have faved her life, and having extreme pain in fwallowing, had determined not to take either food or medicine—it was by my urgent

urgent intreaties, and almoſt obliging her to force down a large glaſs of wine, that ſhe was encouraged to proceed, and is now in perfect health on June the 30th, 1803.

April the 9th, Maſter Wm. W. *(g)*, æt. 6, was ſeized with vomiting, and on the 10th returned to town from Paddington, having a high degree of fever, complete eruption, and conſiderably ulcerated throat. He was convaleſcent on the 18th of April, and rejoined his brothers and three elder ſiſters at Paddington on the 28th. Notwithſtanding his being quite new clothed, and his undergoing complete ablution, and ten days full convaleſcence intervening, this young gentleman certainly conveyed infection to the young ladies on his return to them.

Miſs W. *(h)*, Miſs Frances *(i)*, Miſs Eliz. *(k)*, with their Governeſs *(l)*, were ſent to Paddington, March the 21ſt, where they remained in perfect health until May the 4th. On this day they ſet out for Ramſgate, were indiſpoſed upon the road, and on the fifth, the day of their arrival at Ramſgate, the three ſiſters all exhibited the complete form of the diſeaſe, and all ſuffered a ſmart fever with eruption, and ulcerations of the throat. Their Governeſs was attacked on May the 15th, with ſevere fever and ulcerated throat, *without any eruption.* This lady's tonſils continued to be ſwelled and ſomewhat inflamed and

ſcabrous

ſcabrous till December the 19th, at which period her ſtrength was not fully reſtored.

This account is by no means ſo full and accurate as it might have been, had I had the leiſure to take notes of each caſe. The four laſt, which, of courſe, occurred where I was not preſent, will appear in their proper place.

Although the prophylactic meaſures, adopted by this family, were by no means ſo ſucceſsful and complete, as the zeal and diligence with which they were attempted undoubtedly merited, I think it right to publiſh this reſult, that others may profit by the errors, which were here unintentionally committed; more particularly as theſe errors have tended to eſtabliſh two very important facts, which could not have appeared had the plan of prevention entirely ſucceeded.

The following explanation will ſhow to what circumſtances our failure was owing; and that in the endeavour or the wiſh fully to accompliſh a moſt deſirable purpoſe, we were far from being deficient.

Miſs Maria W. *(a)* was known to have the ſcarlet fever on the 10th of March, the morning ſucceeding her attack. All the children who were then at home, and their attendants, were ſeparated from her, except Anne, the under nurſery maid, whoſe attendance was indiſpenſable, and who,

who, as it appeared, had already received infection. The rules of prevention were ſtrictly enjoined, and might have been completely fulfilled, but unfortunately the original ſource was not ſatisfactorily diſcovered, or even ſuſpected, till it was too late; great part of the miſchief therefore could not be obviated by preventive means. Symptoms of incipient fever appeared upon the under nurſery maid within eight and forty hours of the time at which Miſs Maria *(a)* ſickened. The means of precluding the full acceſſion of the diſeaſe appear to have been effectual in her caſe at the moment, and alſo in that of the houſemaid, who was ſeized about the ſame time, and treated nearly in the ſame manner*.

The nurſery maid continued well from the 12th to the 19th. But as her attendance on Miſs Maria was not to be diſpenſed with, ſhe either imbibed freſh infection from this child, or the original taint muſt have remained latent from the 9th to the 19th of March. It is moſt probable, that the firſt infection was extinguiſhed,

* The adminiſtration of an emetic, a gentle laxative the next day, a light regimen, to which ſucceeded the exhibition of acid. vitriol. dilut., with or without the cinchona pro rebus natis, generally conſtituted the antipyrexial plan, which was the ſame in the ſchool as in the family.

on it's acceſſion, by medical treatment, and that ſhe was reinfected.

Dr. Currie has given an example of the ſuppreſſion of ſcarlatina by cold affuſion. That the timely exhibition of an emetic frequently extinguiſhes fever commencing from the contagion of typhus, is a well-known fact, and that both theſe remedies produce ſimilar effects in ſimilar modes, will ſhortly be explained.

It was, at this time, erroneouſly concluded, that having eſcaped the worſt effects of primary infection, ſhe could not be liable to a ſecond attack; but in this idea we were deceived, both in her inſtance and in that of the houſe-maid, who moſt likely received her infection from the cook, with whom ſhe ſlept, and who was not ſuſpected of having the diſeaſe for ſeveral days. This cook had privately aſſiſted in bathing Maſter Martin in the latter end of March or beginning of April, and was certainly infected at that time; though, from this very circumſtance, perhaps, ſhe was induced to conceal her indiſpoſition ſeveral days.

In attempting to extinguiſh morbid attacks, at the time of acceſſion, previous to their full manifeſtation, ſome uncertainty muſt always exiſt reſpecting their actual preſence in the ſuſpected ſubject, the evidence for which reſts ſolely on high probability. If it ſhall be ultimately aſcertained, that angina contagioſa never

infects the same individual twice*, it will, according to these facts, be necessary to have passed through the complete form of the complaint, otherwise the means of extinction will only suppress the existing taint, and not shield the patient from future attacks. This fact coincides with those of the imperfect inoculation of vaccina or variola.

The three elder young ladies were on a visit to a friend, when the infection appeared at their father's house. On their return home, they were kept in a separate suite of apartments till March 21, when it was judged right to send them, with their governess, to Paddington. Master William and Miss Anna, neither of whom had been infected at the same time with Miss Maria, though this was suspected, remained at home also, in a state of seclusion, till April 1, when they went to Paddington; the interval of seclusion having been deemed sufficiently protracted for the infection to have shown itself, supposing it to have been latent in them. No evil consequences had ensued from sending Miss Maria, after her recovery, to the same place, under the care of a separate attendant,

* Dr. Heberden has seen patients who were twice affected with this disease. And I myself have seen the same accident very recently, June 1803, in two young ladies, who undoubtedly had the disease before. The Doctor justly observes, that second attacks must be very rare.

and

and with ſtrict injunctions not to aſſociate with the three young ladies, who were already at Paddington, which injunction was correctly complied with. With ſimilar precautions, and under like reſtrictions, it was deemed ſafe to allow Maſter Martin to repair to the ſame place. A new æra of infection commenced within four days after his arrival at Paddington, which might have ariſen from ſome infringement of the prophylactic plan between him and his brother William; or, as the cook had occaſion to go every day to the country-houſe, it is poſſible the infection might proceed from her.

TABLE *of the* PROGRESS *of* ANGINA CONTAGIOSA, *in* Mr. W.'s FAMILY.

Patients' Names and Ages.	Date when attacked.	Time of Convaleſcence.	Time of leaving London.
(a) Miſs Maria..... ætat 4	March 9.....	March 16	Went to Paddington, March 23.
(b) Under Nurſery-maid, ætat 20	1ſt attack, March 11 2d attack, March 19	March 29	Went home, March 29
(c) Maſter Martin..... ætat 11	March 13.....	March 28	Went to Paddington, April 4.
(d) Miſs Ann..... ætat $1\frac{1}{2}$	April 8.....	April 12	Went to Ramſgate, May 4.
(e) The Cook.....	April 4, not diſcovered till the 8th	April 14	Went to ditto, May 7.
(f) The Houſe-maid.....	1ſt attack, March 11 2d attack, April 8	April 13 April 19	Went home, April 21.
(g) Maſter William..... ætat 6	April 9.....	April 18	Went to Paddington, April 28, and thence to Ramſgate, May 4.
(h) Miſs W..... *(i)* Miſs Frances W..... *(k)* Miſs Eliza W.....	May 4.....		Went to Paddington, March 20, and thence to Ramſgate, May 4.
(l) The Governeſs.....	May 15.....		

Account of Scarlet Fever in Mr. E.'s School.

In a numerous ſchool, near town, where the ſcarlet fever had infected ſeveral young gentlemen, in conſequence of one of them being ſuffered to aſſociate with his ſchool-fellows, in a few days after his recovery from the complaint, which he had brought with him from home; it was effectually extinguiſhed, and was attended with no unpleaſant conſequences, by adopting the following means:

When it became evident, that the convaleſcent had infected the ſchool, he was withdrawn, and apartments allotted to him completely ſeparated both from the healthy and the ſick; to which apartments it will be ſeen the ſick were removed after a certain period of convaleſcence. The infected were then conveyed to an adjoining houſe, and the doors, which communicate between it and the bed-rooms of the ſchool, were cloſed up, to preclude the poſſibility of any intercourſe. The ſick were there attended by nurſes, the regular ſervants of the family being kept intirely from them; and to prevent, effectually, the progreſs of any farther miſchief, not only their linen, but even their knives and forks,

and plates, &c. were appropriated ſolely to their uſe, and nothing belonging to them was ſuffered to enter the houſe, where the healthy ſtill remained. One of the family, who was neceſſarily called to ſuperintend the management of the ſick, at no time, during the illneſs, went near the ſchool, from an apprehenſion of conveying the infection, but confined herſelf to the care of the invalides. The ſchool room, dining-hall, and all the bed-rooms, ſuppoſed to be infected, were immediately cleared out, and nothing but the bare walls left; they were then white-waſhed and diſtempered; the young gentlemen, in the mean time, occupying apartments, which were known not to be infected, and which were afterwards alſo diſtempered with the ſame colour for the ſake of uniformity. All the blankets, counterpanes, &c. throughout the houſe were ſcowered; the room and ſtair-caſes were ſprinkled with vinegar; the bedſteads were taken down, well ſcrubbed and ſponged with vinegar; and, for ſome time, the feather-beds were expoſed to the open air, and alſo ſprinkled with vinegar. During this period, however, and for ſeveral days, ſome, who had originally taken the infection, but had not ſhown the ſymptoms ſo early as the others, were ſucceſſively taken ill. They were of courſe removed from the ſchool, and their bedding, clothes, &c. ſent with them to the ſick-houſe. Thus, it being generally imagined,

that

that no infection is communicated in the firſt ſtage of the complaint, it was concluded, that ſuch young gentlemen as had eſcaped in the firſt inſtance, were, by the afore-mentioned precautions, now ſecured from all poſſible danger; and the event ſatisfactorily proved, that none of thoſe who fell ill in the ſchool, had, at the time, infective influence. The young gentleman, who was laſt taken ill, ſhowed the ſymptoms on the eleventh day in the midſt of the ſchool, and with him it ſtopped. When it was ſeen that the infection had taken place in the ſchool, the friends of the young gentlemen were informed of it, that they might, if they thought it adviſeable, take them home; at the ſame time it was ſuggeſted, that, as all probability of further miſchief was done away, it ſeemed deſirable that the ſchool ſhould not ſeparate, ſince, if any had the diſorder latent in them, they would not eſcape it by being taken home, but would, probably, ſpread it in their reſpective families; whereas, if they ſhould be taken ill at ſchool, they might be removed to the ſick-houſe, without danger to any one. In conſequence of this ſtatement, out of upwards of ſixty boys, only thirteen were taken home, during the continuance of the fever, and the buſineſs of the ſchool went on as uſual. Thoſe who had had the fever before did not take it a ſecond time; ſome of whom, as well as others who eſcaped, ſlept

with young gentlemen upon whom the eruption came out in the night. It is moreover probable, that the infection was communicated by the breath, or ſome other means, at a very ſhort diſtance, as the diſeaſe was confined to thoſe nearly of the ſame claſs with the convaleſcent, who is about twelve years of age. The very ſmall, and all the upper boys, who ſat at a different part of the ſchool, eſcaped entirely. This proves how very circumſcribed the limits of infection are, and how eaſily it may be ſtopped, where it's preſence is aſcertained or ſuſpected. The fact accords with the obſervations of Dr. Haygarth and other phyſicians, to be found in Dr. Clark's collection of papers, quoted above. Among thoſe attacked with the complaint, ſome were of ſtrong conſtitutions and ſome extremely delicate; the latter, in general, ſuffered moſt. It is neceſſary alſo to obſerve, that in ſome caſes the indiſpoſition is ſo ſlight, that a very minute examination is requiſite to detect it, in which caſe a perſon might continue to infect a ſchool, and do infinite miſchief without it's being diſcovered. In the preſent inſtance, the firſt young gentleman, who caught the complaint, after the return of the convaleſcent into ſchool, felt no inconvenience but a head-ach four days afterwards, of which he did not think it needful to complain; and the next day he dined at home, when a redneſs

on his ſkin was obſerved by his friends, who, conſidering it to be ſome ſlight raſh, ſent him back to the ſchool the ſame evening. The day following the redneſs diſappeared, and he took his place in the ſchool, as uſual; ſo that this circumſtance was not known to the maſter until the complaint became general, when he alſo was ſeparated, and ſent to the convaleſcent apartments; ſhortly after the ſkin peeled off his hands. Out of thoſe who were taken ill, five complained of ſickneſs and head-ach, yet without eruption. An emetic was immediately given, and the next day they ſeemed to be quite well, but were, notwithſtanding, kept ſeparate both from the ſick and healthy, being ſent to the convaleſcent apartment. It appears therefore moſt probable, that the progreſs of the diſeaſe, in three of theſe boys, was arreſted by their emetics, but in the other two reſumed, for they afterwards underwent the diſeaſe in its complete form. The only mode by which the reinfection of theſe two boys could be fairly accounted for is this: they were among the firſt who ſickened, and conſequently were ſent to the convaleſcent apartment, at a time when the original cauſe of the infection had himſelf not been convaleſcent more than eleven days; and moſt probably they there received the infection a ſecond time from G. W. the ſecond convaleſcent who was withdrawn from ſchool. The fact correſponds with

with the caſes of the houſe and nurſe-maids in Mr. W.'s family, and the proper inference ſeems to be, that the means which extinguiſh common fever, diſpoſe of the infective influence at the moment, but that the ſubject is liable to future attacks of the ſame contagion, when expoſed to it's operation, *vide page* 18. This inference is of the greater importance, becauſe theſe inſtances of reinfection would not have taken place, had it been underſtood that infection could have again aſſailed the ſubjects here cited. As it was uncertain when thoſe, who evidently had had the complaint, could, upon their convaleſcence, be reentered into the ſchool again, it was ſettled, that the ſick ſhould, upon the 22d day after their recovery, be allowed to join the convaleſcents, where they remained five weeks, previous to their being readmitted into the ſchool, making altogether two months from the period when each was taken ill; and, in the mean time, they had allotted to them a ſeparate ſchool-room, play-ground, dining-room, and bed-chambers. The convaleſcents being by theſe means completely ſeparated from the healthy and the ſick; as it was feared, that by returning too ſoon into ſchool, they might infect the healthy; or, on the other hand, themſelves be reinfected by remaining with the ſick. From the nature of the houſe and grounds this threefold ſeparation was eaſily effected. After quitting the

the ſick-houſe, the convaleſcents were not ſuffered to return to it; they left behind them all their clothes, not being ſuffered to retain either hats, gloves, or garters; and, beſide theſe precautions, they were bathed in vinegar and water prior to their removal to the convaleſcent apartments.

The mode of treatment, during the young gentlemen's indiſpoſition, was as follows:

Upon complaining of head-ach, ſickneſs, or ſore-throat, or ſeeming to be in any way indiſpoſed, they were immediately ſent out of ſchool; an emetic of ipecacuanha wine was given; and they were then put to bed (not in the apartments where the ſick were confined, nor in the convaleſcent apartments, but in one reſerved for the purpoſe), after which, ſome weak wine whey was preſcribed for their ordinary drink, and ſaline draughts, with a ſmall proportion of antimony, were given in the way of medicine, which, in no one inſtance, failed to *produce perſpiration*; during this time they were alſo ſupported with beef tea.

After the eruption began to ſhow itſelf, or the throat became affected, the patients were removed to the ſick-houſe, their bedding, &c. being ſent with them; but until it was aſcertained that they had got the fever, the nurſes, who attended the ſick children, were not allowed to go near them, another perſon being appointed

pointed to take care of thoſe, whoſe caſes were doubtful. In ſome inſtances, the fever was very ſlight, and the medicine given to thoſe, who were ſo ſlightly indiſpoſed, was tincture of roſes, with a few drops of elixir of vitriol, perſpiration being always previouſly excited in the mode above-mentioned; this, with the addition of port wine, was uſed as a gargle; a ſtrong camphorated volatile liniment was alſo frequently rubbed on the outſide of the throat. If the throat was much affected, a muſtard poultice was applied, and kept on, as long as it could be borne, without producing too great a degree of irritation, which was carefully attended to. The nouriſhment they took was ſago, tapioca, with port wine, and negus. Several were ſo well as to be able to quit their beds on the third day, and ſo little debilitated as to be diſpoſed, and capable of amuſing themſelves. Bark was given with the elixir of vitriol, and generally, on the fourth and fifth day, they were allowed to paſs the greater part of the day in the open air. Three were more ſeverely attacked; for them other medicines were preſcribed. One young gentleman had a conſiderable degree of fever, and a bad ſore-throat, for five days; to this patient a warm bath was ordered; after which his fever abated, his throat got better, and in a few days he alſo was ſufficiently recovered to be ſent into the open air. As much care as poſſible was

taken

taken to keep the children clean, their linen and bedding was well ſprinkled with vinegar, the rooms conſtantly ventilated; and whenever their linen was changed, it was inſtantly thrown into water. They continued for ſome weeks after their recovery to take bark, they were alſo ordered to eat plentifully of animal food, and to drink ale or wine at their dinners. Their breakfaſts and ſuppers were milk, and between each meal they had a ſlight repaſt. Such as were of weakly and delicate conſtitutions had beef-tea, ſago, and calf's-foot jelly, in the courſe of the morning. The number under the above mode of treatment was fifteen, and they are now all in perfect health; nor has dropſy, or any ill ſymptom whatever appeared among them.

TABLE.

TABLE.—*Progreſs of* SCARLET FEVER *in the School and Sick-Houſe.*

No. 64, Scholars in all.	Patients Names and Ages.	Date when attacked.	Convaleſcent.	Infected, 20.	Uninfected 41.	Suſpected. 3.
* Sent into School, Aug. 6th, and remained in School until the 16th; he was then withdrawn, and kept out till the 3rd of October.	* Cor. H. 12	Aug. 1	Theſe boys were all convaleſcent between the third and ſixth days after their attack.		The family, aſſiſtants, and ſervants.	J. 12
	C. W.....12	Aug. 10				G. H..12
	P.....12	Aug. 12				E. A..10
	D. 10	Aug. 14				
	G. U.....10	Aug. 14				
	R. A.....12	Aug. 15				
	S..... 9	Aug. 16				
	H. 12	Aug. 16				
	S. H. 11	Aug. 16				
	F.....10	Aug. 17				
	G. 10	Aug. 17				
	S..... 8	Aug. 19				
	B..... 8	Aug. 21				
	B..... 9	Aug. 21				
	I..... 8	Aug. 23				
	J. A. 13	Aug. 25				
Ceaſed in School.	A. 10	Aug. 28				
	‡ D..... 9	Aug. 28				
	§ Ch. H. 11	Aug. 30				
† Remained in ſchool till the 20th, the circumſtance of his having had the eruption not being diſcovered before.	†G.W. the boy upon whom the eruption was not obſerved.	Aug. 8				

‡ D.—An emetic, the 18th of Auguſt, on account of head-ach and ſickneſs.

§ Ch. H.—Emetic, Aug. 20th.

The account here given may be implicitly relied upon, becauſe the veracity of thoſe who give it is undoubted, and at my requeſt they noted down all the dates and circumſtances as they occurred; and the moſt unremitting vigilance was exerciſed to prevent the ſlighteſt infringement of the rules of ſeparation.

I think it right to remark, in this place, that having frequently, in the courſe of the laſt ſixteen years, witneſſed the evil conſequences which enſued from the incautious and haſty diſperſion of the members of ſeminaries, I ſuggeſted the propriety, and the public advantage which would accrue from the retention of the ſcholars in the ſeminary, under due reſtriction. At the ſame time I requeſted, that the boy whoſe too early return into ſchool had generated all the miſchief, might be immediately withdrawn thence. This requeſt was complied with inſtantly, and my ſuggeſtion adopted with a promptitude which reflects great credit on the maſters of this academy.

Indeed, too much praiſe cannot be beſtowed upon it's conductors for their patience, their zeal, and public ſpirit, their humanity, and unremitting attention to the ſick. Two very great benefits may be derived to all ſimilar inſtitutions, by the meritorious example they have exhibited. 1ſt. A complete warning is held up to ſeparate every ſingle inſtance of fever, not only at it's

firſt commencement, but alſo for ſome time after convaleſcence. 2dly. When infection has ſurreptitiouſly found it's way, and has affected a number, this account of it's ſuppreſſion proves the practicability of limiting the progreſs of infection, and of totally extinguiſhing it without the neceſſity of diſperſing the members of the ſeminary. Having ſhown, I truſt, the evil conſequences of diſperſing the members of a ſeminary, I cannot omit to notice another practice, which is dangerous and cruel in the extreme. It is, that when the ſcarlet fever has made it's appearance in any individual of a private family, nothing is more common than to diſperſe the young people by ſending them off to ſchool; where, having already the infection latent in them, they are, in a few days, attacked with the complaint, and ſpread diſmay and danger throughout the ſeminary. Another practice, ſtill more dangerous, from the circumſtance of convaleſcents being capable of communicating infection for ſome time, is that of returning children to ſchool ſhortly after their recovery, not unfrequently with a view of changing the air; I muſt add, too, that they ſometimes bring back with them part of the clothing which they wore, either during their ſickneſs or convaleſcence. If ignorance is the excuſe for all this, let it be remembered, that it is an ignorance

rance by which human beings are deſtroyed, and that plea ought not *now* to exiſt.

I think it neceſſary, alſo, to appriſe my readers, that the ſtrict ſeparation of the ſick, and the free admiſſion of pure air, where ſituation and the ſeaſon of the year admit it's abundant introduction, are more to be relied upon than any fumigations, ſuch as the vapours of the muriatic, the nitrous, and the acetous acids; theſe are very uſeful auxiliaries, but, in my opinion, ought not to be ſolely depended upon as principals. "The methods of Morveau or Car-"michael Smith have never been practiſed in "theſe wards, or in the former wards of the "(Liverpool) Infirmary; and our experience "ſeems to decide, that the proper uſe of pure "water and pure air may wholly ſuperſede "them." Currie's Letter, Collection, &c. p. 170.

The facts to be deduced from a ſurvey of theſe combined accounts appear to be the following.

1ſt. Scarlet fever may be ſuppreſſed in it's commencement. But the perſon, who thus eſcapes it's full formation, is liable to be reinfected.

2dly. Convaleſcents from ſcarlet fever are capable of communicating infection ten days, or a further period, after their perfect recovery, not yet preciſely defined.

3dly. It appears plainly from the caſes here collected, that angina maligna ulceroſa is the ſame diſeaſe with ſcarlatina.

In all the cafes which occurred in the family, the period from receiving infection to that of ſickening, appears, as nearly as can be computed, to be from four to ſix days.

This interval accords with Dr. Heberden's obſervation: he ſays, "This fever has begun to ſhow itſelf on the 5th day after the infection was moſt probably taken by thoſe, who being perfectly well before, have been brought to the houſe where ſome children were ill of it." p. 22. Med. Comment.

In the firſt two or three examples of the infective influence in Mr. E.'s ſchool, the ſame interval was nearly as ſhort, but the ſource continuing the ſame, it appears as if the contagion became more tardy and inert in it's operation; and although much muſt be ceded to conſtitutional or accidental ſuſceptibility, the dilution or concentration of this poiſon, as well as that of others, muſt alſo be admitted into the calculation. We ſee that morbid effects correſpond with the degrees of ſtrength and the virulence of pyrexial poiſon, in all the proportions betwen immediate fatality and the formation of a mild intermittent fever; we alſo ſee every degree of ſuſceptibility, from an entire impaſſive reſiſtance to infection, and from imperceptible conſtitutional effects, to the moſt dangerous and fatal ſymptoms; inſtances of which are to be found

in

in the plague, yellow fever, and ſmall-pox, compared with vaccinia. It is not neceſſary to ſuppoſe, that all who were infected in the ſchool of Mr. E. received contagion at the ſame time, or even on the ſame day, which, according to Dr. Haygarth *, happened in the family of Mr. Cheers; the interval is too great between the ſickening of the firſt boys and the laſt, making every allowance for thoſe boys who had more intimate intercourſe with C. H. and G. W., in ſucceſſion as their predeceſſors were removed from their ſociety, to be entirely imputed to difference of habits and conſtitution. As there is a point at which the power of communicating infection in any individual muſt ceaſe, it is moſt probable, that the contagious influence becomes languid and ſlow in propagating itſelf, in proportion as the convaleſcent approaches to a ſtate of perfect health, or as the interval from his illneſs increaſes. I muſt candidly confeſs, that in neither of theſe relations, the path of infection can be ſo accurately traced, as that we can derive certain information, either when a ſubject preciſely begins or ceaſes to communicate infection. Although the plan of prevention was executed with the utmoſt ſtrictneſs and fidelity in the ſchool, and was attempted with the greateſt

* Vid. Table I, p. 20, of his Letter to Dr. Percival.

zeal in Mr. W.'s family, yet concealed ſources of infection exiſted in both caſes, which for a time eſcaped detection. But a conſiderable part of the miſchief originated from the miſconception, that convaleſcent ſubjects are not capable of imparting contagion to an indefinite period, when they are apparently well, and even when their clothes are entirely new, and their whole perſons have undergone frequent ablutions. In Mr. E.'s academy, the whole of the evil, in the firſt inſtance, proceeded from one convaleſcent; and two were afterwards reinfected by aſſociating with the ſecond convaleſcent who was withdrawn from ſchool, viz. G. W., p. 25. In Mr. W.'s family, two convaleſcents reſpectively renewed the infection at two diſtinct intervals of time.

The public are, therefore, moſt ſeriouſly admoniſhed, by theſe inſtances, of the great danger of allowing convaleſcents to mix too ſoon in ſociety. I have no doubt, that thouſands have been infected in this way, from the moſt unſuſpected quarters, and will continue to be ſo, unleſs the momentous fact here ſubſtantiated be made known and acted upon with a conſcientious regard to the public weal. The preciſe time when a perſon receives infection may very poſſibly eſcape detection, or cannot exactly be aſcertained, in a great majority of inſtances, becauſe the *condition* of the recipient, and the concentrate or diluted ſtate of the

poiſon

poiſon to be imparted, are ſubject to degrees of variation ſufficient to influence, moſt materially, the interval of time in which evident effects are produced upon, or from infected perſons; yet ſo ſtriking an analogy ſubſiſts among acute contagions, with regard to their time of manifeſtation, as well as that when the impregnated conſtitution begins or ceaſes to be infectious, that a period of ſafety from infective influence may be ſufficiently eſtabliſhed to inſure prevention, by a more ſtrict inveſtigation of this part of the ſubject with the aid of a more extended record of facts. The ſame uncertainty prevails with reſpect to other contagions, as well as that of ſcarlatina; and Dr. Ruſſel obſerves, "As it is "not known how ſoon a perſon infected be- "comes contagious, ſo neither is it known at "what period the power of communicating "the diſeaſe *ceaſes* in convaleſcents from the "plague;" p. 304.

But the fact being fully conceded, that the preciſe times, either from the admiſſion of infection to the evolution of diſeaſe, or after the appearance of the latter to the time when the infected ſubject ceaſes to be contagious, cannot be definitely marked; yet, being poſſeſſed of complete information with reſpect to every ſource from which infection can emanate, being fully acquainted with every avenue through which it can gain acceſs into the human frame, we cer-

tainly ſhall have acquired a power of controlling it's influence, which being improved by a more univerſal application of preventive meaſures, may be ſo perfected as to render innocuous, and ultimately extirpate every form of contagion. We are hence ſtrongly induced to enter into the intereſting inquiry, by what variety of modes infection can poſſibly be imparted? But, before we proceed to this more general inveſtigation, it may be proper to make a few remarks on the nature and treatment of the diſeaſe, which is the immediate object of our attention.

The peculiar phenomena of ſcarlatina anginoſa ariſe from the ſituation, which it invariably occupies in the human body. The ſpecific inflammation excited by this contagion always commences upon a cuticular ſurface, and like that of the carbuncle, deſcends into the cellular and vaſcular ſubſtance immediately beneath it, giving riſe to ulceration, more or leſs deep and extenſive, in thoſe parts which are diſpoſed to ulcerate. The inflammation induced is of the ſame kind, whether it appears in certain *parts* of the face, over the whole ſurface, or only in the cuticular covering of the tonſils and fauces, or over both theſe and the whole exterior of the body. On the degree, the extent, and the time ſuch inflammation has ſubſiſted, depend the mildneſs, the violence, or the danger

ger attendant upon the diſeaſe. The immediate effect of the inflammation of the ſkin is the ſuppreſſion of perſpiration. The more high and general this cuticular inflammation becomes, the more ſevere will be the attendant fever; and the more complete the confinement of perſpiration, the greater will be the effuſion of perſpirable fluid into the cellular membrane. The enlargement of the lymphatic glands is alſo another conſequence of the inflammation of the cutis. The ſeat of this diſeaſe being the ſame on the exterior of the body with that of the internal parts of the throat, and the inflammation being eryſipelatous in both caſes, from this circumſtance we ſhould be juſtified in oppoſing the idea, that ſcarlet fever is a different kind of diſtemper from the malignant or ulcerous ſore throat. I have ſeldom ſeen a caſe of ſcarlatina ſimplex, as it is called, where the eruption, if complete, full, and univerſal, was not accompanied with ſome redneſs or degree of enlargement in the fauces, or ſtiffneſs and ſlight intumeſcence of the parotid and ſubmaxillary glands. Dr. Withering had made the ſame remark: "The velum pendulum palati, the uvula, the "tonſils, and the gullet, as far as the eye could "reach, partook the general redneſs and in-"flammation." P. 17. But there are ſurer grounds of oppoſition than this, and I have the honour to found mine on the ſame premiſes with

the late venerable Dr. Heberden. "From the "foregoing deſcription of ſcarlet fever and "malignant ſore throat," he obſerves, "it ſeems "highly probable, that they are both names of "the ſame diſtemper, with ſome little variety "in a few of the other ſymptoms; and this "opinion is confirmed by our finding, that they "are both epidemical at the ſame time. Even "in the ſame family, where a number of chil-"dren have been ill either together or imme-"diately after one another, ſome have had the "diſtinguiſhing ſymptoms of ſcarlet fever, and "others of the malignant ſore throat." Comm. p. 27, 28.

Theſe were preciſely the circumſtances, which occurred in Mr. W.'s family and in the ſchool. The primary ſources of contagion being identical in each, every form of angina contagioſa, or ſcarlatina was exhibited in them, ſome with *angina alone*, others with *angina* and *eruption combined*, others with *eruption* only. The cauſe of the diſeaſe, and the ſource of contagion, being the ſame in all the inſtances of the preceding accounts, the angina ulceroſa, as deſcribed by Fothergill, Huxham, Johnſtone, Cullen, &c. *, being moſt commonly attended with

* Fothergill, Sore Throat, 1754. Huxham, Ulcerous Sore Throat, 1757. Johnſtone, Malignant Fever, 1756. Throat Diſtemper. Medical Obſervations and Inquiries, vol. i, p. 211.

cuticular

cuticular ſcarlet, or eryſipelatous inflammation, ſuch as appears in ſcarlet fever, the inference is plain and obvious; no ſpecific difference ſubſiſts between ſcarlatina ſimplex, ſcarlatina anginoſa, and cynanche maligna. The appearances in each only mark gradations of one and the ſame diſeaſe, which gradations ariſe from difference of ſeaſon, ſituation, conſtitution, and the greater or leſs virulence of the poiſon itſelf. The contrary doctrine maintained by phyſicians of great eminence* has in my opinion produced pernicious effects in two ways. 1ſt. Common caſes of ſcarlatina, having been ſuppoſed to belong to a mild and ſafe claſs of diſeaſes, have been treated with too little attention in ordinary practice. It is true, that a very great majority of patients recover from ſcarlet fever, yet it muſt be allowed, on the other hand, that general anaſarca, tumid glands, hectic fever, cough, and ſometimes dyſenteric ſymptoms, are the too frequent conſequences of the imperfect cure of ſcarlatina. 2dly. It being generally preſumed, that the ſame contagion does not in one inſtance, produce eruption, and in another ulcerated throat only, among the members of the ſame family where ſcarlet fever is preſent, the ſtate of the throat is too often not adverted to in proper time.

* Cullen and Fothergill.

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The angina creates very slight inconvenience* to the patient at it's commencement, and being unsuspected by others, great prostration of strength, and difficult deglutition, or even inability to swallow, seem to seize the patient at once; while deep extensive ulceration in the throat is discovered to have made so imperceptible and fatal a progress, as imminently to endanger life, or to have passed beyond the reach of art. Thus many lives have been inadvertently lost, which might have been preserved by more timely attention, or different views of the cause of the disease. This, I believe, is the true history of suddenly fatal cases of malignant sore throat and scarlet fever. Even in severer cases of scarlet eruption, conjoined with angina, I have been induced to suspect, from the tonsils continuing enlarged and irritable, and a short

* "It is by no means unlikely, that the patients should "show very little attention to these small sores (aphthous "ulcers) for they seem to occasion very little pain, far less "than what is felt in a very slight inflammatory sore throat." Heberden's Com. p. 24.

Dr. Navier, quoted by Dr. Withering, p. 47, makes the following remark, which coincides with my experience, and the present observations. "Unless the patient be relieved at "the first attack of the disease, gangrenous escars appear "at the bottom of the fauces towards the velum *pendulum* "*palati*, and when these take place, but few recover. This "gangrene frequently seizes upon the œsophagus and the "windpipe, *before* we *perceive*, or *endeavour* to *counteract it*."

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teizing cough remaining after the other ſymptoms had vaniſhed, that ſufficient and timely attention had not been ſhown to the ſtate of the throat in the treatment, during the prevalence of the fever. This neglect, I am perſuaded, has given occaſion to frequent returns of ulcerated ſore throat, to chronic enlargement of the tonſils, to external ſwelling and inflammation of the ſubmaxillary glands, and the ſuppuration of the ſame.

Dr. Heberden notices the ſame circumſtance, without adverting to the cauſe.—" I have met " with ſeveral grown perſons, who have had " frequent returns of a ſlight ſore throat, which " at theſe times was beſet with little ulcers, " ſimilar to thoſe of the malignant ſore throat, " without much fever, and without any diſcolour- " ing of the ſkin." Com. p. 29. " After the " danger is paſt, the glands under the ears will " ſometimes ſwell with conſiderable pain, and " even come to ſuppuration, &c." The ſwelling of the ſubmaxillary, parotid, and other ſmall glands ought to be carefully attended to; and when the hardneſs and tumefaction are conſiderable, the early application of leeches to the ſwelled parts, and diligent ſimple fomentation, will prevent this affection from coming to maturity. The tonſils themſelves, particularly in ſcrofulous habits, and in conſequence of cold, ſometimes inflame, ſwell, and come to ſuppuration,

tion, after the aphthous ulcers have been removed and ſubdued. In theſe caſes, the application of leeches, with the inhaling of the vapour of hot water, prevents a great deal of ſuffering; and it being ſtrictly a local affection, local applications meet the whole of the miſchief, and the general debility, which then prevails, may be obviated without interruption. The practical uſe which flows from the conviction, that ſcarlet fever and angina maligna own the ſame origin, are twofold, and each equally important; 1ſt, that parents, teachers, and practitioners, being appriſed of the probable occurrence of malignant ſore throat, wherever ordinary ſcarlet fever prevails, their early and ſeaſonable attention will, in future, be more cloſely drawn towards thoſe in whom no ſigns of diſeaſe, except laſſitude and debility appear, with a languid and dull countenance: in theſe caſes, they will be induced to watch the ſtate of the throat, even where no complaint is made by the individuals themſelves, who, in the beginning, feel no ſoreneſs or pain in their throat, no difficulty in deglutition, and will ſcarcely acknowledge an almoſt imperceptible ſtiffneſs about the neck. It is the peculiar province and duty of the practitioner, to pay even a minute attention to this tendency of the morbid influence. The preſervation of one life in one hundred will amply reward his labour, and compenſate his anxious vigilance. 2dly, On the

the other hand it not unfrequently happens, that the angina alone, without the attending eruption, appears firſt in a family. The eruption being abſent in ſuch inſtances, no ſuſpicion of the contagious quality of the diſeaſe ariſes, and it is thus introduced, and often fatally propagated; the true ſource, not being imagined, remaining too long concealed and unoppoſed. The opinion which I have entertained on this ſubject has enabled me to ſtop the progreſs of this form of ſcarlatina, or angina contagioſa, in particular families; one very ſtriking inſtance of which occurred in the courſe of the laſt month, and which will be alluded to in the ſequel. The general treatment of ſcarlet fever ought to be grounded upon the knowledge of it's ſource, and it's debilitating propenſity. But at the ſame time that this is acknowledged to be the true complexion of it in an enlarged and general ſenſe, yet where ſuch various degrees of morbid affection take place, general rules cannot be laid down with propriety, or carrried into effect with ſucceſs in every inſtance*. The practitioner is therefore

* From theſe ſerious practical conſiderations, I cannot accord with the following ſentiment, high and reſpectable as the authority certainly is whence it proceeds. "But the "ſolution of this queſtion (whether the ſcarlatina or cynanche "maligna be one and the ſame diſeaſe) is of very little im-"portance; for let the diſtempers be ever ſo different, the "method of cure in both is exactly the ſame."

bound

bound to exercise his own discrimination in individual cases, and proportion his mode of prescription to the degree and the form in which the disease individually appears. The too early exhibition of tonics and cordials is equally pernicious with profuse and excessive evacuations. For this reason I object to the indiscriminate use of strong antimonial emetics, which commonly induce too great a degree of debility, where the tendency to it is inherent in the disease itself*, and the inflammatory symptoms extremely transient, even in the robust and adult subject. There are two indications to be answered by emetics in this disease, corresponding with the different stages in which they are administered. In the first stage, the great good effect of an emetic is to restore obstructed perspiration, which is of the greatest consequence in mitigating and shortening the febrile period in this particular disease. In more advanced periods, where this has not been done, an emetic, if not too long deferred, will excite perspiration, and will also act mechanically in cleansing the throat, discharging the sloughs, and inducing a more

* "For the enfeebled and disordered state of all the "functions of the body evidently points out such a malig- "nity of the fever," &c. Heberden, Com. p. 25.—"The "languor, feebleness, and inquietude are greater than might "be expected from the apparent degree of fever." Ib. p. 27.

active

active and healthy secretion in the glands and neighbouring secreting surfaces. In neither of these instances are violent emetics required. Mercurial or drastic purges are liable to the same objection. The plan, which I adopted with general success in Mr. E.'s school, will be found equally safe and efficient in a great majority of mild incipient cases. My general intention was to diminish the violence of fever by gentle evacuations, by relaxing the skin, inducing moisture, and after this, by an early assumption of moderate tonics and nutritives, to prevent the access of great weakness during the actual presence of the disease, and by protracting the use of more powerful tonics and a full diet over the convalescent state, to guard against the approach of the ordinary consequences of scarlatina, viz. anasarca, &c. This mode of practice, like every other, must be appropriated to the peculiar habit and circumstances of the patient—those of robust and plethoric constitutions require a shorter continuance of, and less powerful tonics, than those of a contrary frame; but no constitution ought to be allowed to struggle *unassisted* through the disease itself, or through the convalescent state. If the milder instances of scarlatina demand the physician's vigilant eye, to prevent future ills, where no immediate danger threatens, the severer instances of this pestilence, where affection of the throat constitutes most urgent degrees of

hazard, require his utmoſt ſolicitude and ſkill. The inſidious progreſs of ulceration in the organs of deglutition has been permitted too often to rob an afflicted family of a valuable parent, or the tender parent of a much beloved child, even where the full manifeſtation of ſcarlet efflo-reſcence has given, though too late, undoubted proof of the exiſtence of the nature of the malady. Two remarkable inſtances of this kind occurred early in my practice in this part of the world: two fine children, who were ſuppoſed to have been poiſoned, were lying *in articulo mortis*, in a ſtate of ſuffocation, their faces extremely ſwelled, and their whole ſurface covered with ſcarlet efflorescence. It moſt frequently happens, that the guttural is the primary affection*, and the efflorescence a ſymptom, which appears, after the conſtitution is univerſally impregnated, only on certain ſkins diſpoſed to receive it; conſequently, ſloughing and ulceration have often made great

* It is moſt probable, that the diſeaſe was itſelf originally local, and confined to the throat, and that the general eryſi-pelatous affection of the ſkin was a ſubſequent effect induced under a general febrile ſtate of the body, and peculiar condi-tion of the ſkin. "When we were on this iſland, Milo, (ſays "Tournefort), there raged a terrible diſtemper not uncom-"mon in the Levant. It carries off children in twice "twenty-four hours. It is a carbuncle or plague, ſore in "the bottom of the throat, and attended with a violent "fever." Voyage to the Levant.—A very natural origin of the diſeaſe in queſtion may be inferred from this quotation.

and

and dangerous progreſs in the firſt inſtance. The rapidity with which ulceration advances, and the degree of danger attending it's progreſs, ſeem to depend on the part of the throat which is diſeaſed, and the depth the ulceration has attained before it is noticed. If one or both tonſils only are affected, facility of deglutition will be very ſlightly interrupted, and the diſeaſe will ſpread gradually, either downwards upon the pharynx, or upwards and laterally on the palatum molle, uvula, or velum pendulum. The uvula, arch of the fauces, pharynx, larynx, and muſcular parts immediately engaged in the act of ſwallowing, being firſt attacked, give occaſion to the moſt dangerous and ſpeedy march of ſymptoms. In ſuch caſes, as ſoon as ulceration has entered on the muſcular parts, the patient finds it extremely painful and difficult to force down ſolids or fluids, his reluctance to make the effort increaſes with the extenſion of the ulceration, which, if not counteracted by his own reſolution to ſwallow frequently, gains upon him ſo quickly, as totally to deprive him of the power of deglutition, and he inevitably loſes his life. How much the difficulty and danger of theſe circumſtances muſt be aggravated in infants and children, ſo as to preclude the poſſibility of their recovery, may be readily conceived; and, in reality, theſe too often become the la-

mentable objects of the practitioner's unavailing regret--

"Medicas exercet inaniter artes."

These instances have occurred to me several times, and I have found it necessary to recommend the exhibition of wine or negus*, with bark and the mineral acids, to be taken alternately with strong soup, every hour or two, in proportion to the advancement of the ulcer, the debility of the patient, &c. for eight and forty hours in succession, or three days and nights without intermission, if occasion requires. Life has been saved by these extraordinary efforts, which otherwise must have been lost.

The cases in which I have found this treatment to be most efficacious and necessary were those of angina contagiosa without eruption, and where the disease was making, or had made, rapid and unsuspected advances in the organs of deglutition. The occurrence of this species of danger is more rare, where efflorescence accompanies angina; but it does happen, and not unfrequently, where the throat has been originally much affected, and has not been sufficiently

* Negus, of the following composition, forms a very pleasant and grateful beverage for the patient. Wine, eight parts; water, four parts; lemon juice, one part; sugar, a sufficient quantity, or none, according to the taste of the sick.

watched,

watched, the eruption and fever having engroſſed more than their due ſhare of attention. In ſuch inſtances, where external tumefaction of the face and throat have ſupervened in a great degree, the circumſtances are generally irretrievable; and I beg it may be remembered, that every fatal termination which I have ſeen of ſcarlatina, has been ſolely imputable to the ſtate of the throat itſelf, or to the continuation of the ſame ſpecies of inflammation along the lining of the trachea and bronchial veſſels, which induces ſuffocation. It will be a good rule, therefore, to proportionate early and ſeaſonable medical exertions to the ſeat of ulceration in angina contagioſa, remembering, that the moſt hazardous ſituations, and which require the moſt prompt and uninterrupted aſſiſtance, are thoſe immediately concerned in the act of deglutition, and are ſo near to the larynx and trachea, as to afford a ready path of communication to thoſe organs, which are eſſential to life. I have already remarked, and wiſh to repeat the ſame admonition on every fair occaſion, that extremes in medical practice ought to be very cautiouſly avoided, however authoritatively upheld, and that the neceſſity is very unfrequent indeed, which juſtifies their adoption. In vol. i, p. 211, Med. Obſerv. and Inquiries, an account is given of ſcarlatina anginoſa contagioſa, under the denomination of *throat diſtemper*, where bleed-

ing and other evacuations were equally pernicious with the indiſcriminate exhibition of cinchona. It muſt be allowed, that the moſt fatal conſequences having enſued from bleeding, &c., in Fothergill's and Huxham's time, who ſucceſsfully oppoſed this deſtructive practice; the contrary extreme of exhibiting tonics prevailed in Dr. Withering's. But has he not recommended the frequent adminiſtration of ſtrong antimonial emetics in a manner equally exceſſive? More than twenty years have elapſed ſince Dr. Withering's practice was made known; great changes have taken place ſince that time in the habits and manners of all ranks of people, all which have tended to enervate and weaken, more eſpecially the inhabitants of great cities, and, moſt of all, thoſe of the capital. At the preſent time, therefore, and in this town, very few caſes will require the active treatment propoſed by Dr. Withering. Moreover, the caſes which he has adduced in ſupport of his practice do not ſeem to have required either the frequent repetition, or the violent operation of the emetics, which he thought it right to preſcribe.

His firſt caſe is that of a very violent diſeaſe, aggravated by the premature exhibition of cinchona. Dr. W.'s fear of purging was ſo great, that he ſuffered his patient to remain coſtive eight days. Would not the interpoſition of a mild laxative or two have mitigated the moſt violent of the

ſymptoms, and have rendered the frequent repetition of vomiting leſs neceſſary, and conſequently leſs injurious to the future health of his patient? To my certain knowledge, no treatment lays the foundation for future dyſpepſia, and all the miſeries of an enervated ſtomach, more decidedly than repeated vomits.

2d Caſe. Few conſtitutions leſs robuſt than this patient's could have withſtood the conſequences of ſuch treatment. It does not appear that the diſeaſe ceaſed to recur, until the vol. alkali, camphor, & contrayerva as a medicine, and the wine whey as a common drink, were allowed him. P. 108.

The third caſe, in my opinion, indicates no ſuperiority of treatment compared with other modes; the ſixth day is the uſual term of the diſeaſe. The chief peculiarity was the colour of the ſkin; and Dr. W. certainly had the merit of diſtinguiſhing, that the dark tinge of the efflorescence was not owing to putreſcence. But here were no ulcerations of the throat, conſequently no urgent danger.

The fourth is a caſe of dropſy, the moſt ordinary and too frequent ſequel to ſcarlatina, when the violent inflammation of the ſkin has not been moderated by diaphoretics and laxatives, and the patient has been allowed to ſtruggle through the diſeaſe itſelf, and the convaleſcent ſtate, without help.

The fifth caſe does not exhibit the ſuperior advantages of emetics. The diſeaſe was protracted to the eleventh day. A longer period than uſual in ſimple ſcarlatina, of which this was an inſtance; and being unattended with ſloughs or ulceration, was, comparatively, a ſafe caſe; which, in general, yields ſooner to different treatment. Diaphoretics and the warm bath were here ſtrongly indicated.

The ſixth caſe is a ſtriking example of the injurious effects of the too early and repeated uſe of the cinchona; and is alſo a proof, that the red eruption of the ſkin is an adventitious occurrence, for though it was abſent in this inſtance, the ſkin peeled off. I have myſelf, very lately, attended a young lady, whoſe throat was the only apparent ſeat of her diſorder, which I pronounced to be the ſcarlatina anginoſa contagioſa. She was ſeparated immediately from the reſt of the family; and her attendant caught from her the ſame form of the diſeaſe. In neither caſe was any efflorescence preſent, yet, in both, the cuticle ſcaled off in the ſame manner as is uſual after the moſt complete eruption. Acting upon the principles here laid down, all communication was cut off, by which the greateſt part of a very numerous family was preſerved from the diſeaſe. The patient's body-linen not having been put into cold water, the ſervant who waſhed it, and another maid who

ſlept

ſlept with her, were affected by it, both of whom had ſlight eruptions, with conſiderable fever and ſore throat. It may be obſerved, that theſe four patients had only one emetic each in the beginning; and perſpiration was excited in all. They uſed the mineral acids in medicine, and vegetable acid in negus, with the beſt effects. Their recovery was effected with eaſe, and their convaleſcence complete within ſix days; the ſtrength leſs impaired than in ſimilar caſes, under different and more debilitating treatment. As far as my experience dictates, I muſt own, that I ſee no reaſon to prefer the excluſive exhibition of alkalies and abſorbents, ſo highly commended by Dr. Withering, to the aſſumption of vegetable and mineral acids, particularly the muriatic, unleſs where purging is either preſent, or ſupervenes ſoon after their adminiſtration. The purging mentioned by the moſt eminent writers* on ulcerated ſore throat with red eruption, which was no other than the ſcarlatina, ſeems always to have been a dangerous ſymptom; but the caſes to which they allude were of the worſt kind, far advanced, of a truly malignant caſt, which, on account of a more early application for aſſiſtance, and from other cauſes, are not now ſo frequently met with, at leaſt in this part of the

* Fothergill, Huxham, Johnſtone. Dr. Heberden alſo warns us againſt purging till the fever declines, &c. P. 29.

kingdom. It certainly does not occur in the moderate inſtances of ſcarlatina, and the dread of it's preſence ought not to prohibit the uſe of mild laxatives; which, as far as I have obſerved, uniformly abate the heat, thirſt, head-ach, reſtleſſneſs, &c.; ſymptoms which enhance greatly the patient's ſufferings, and protract, as well as aggravate, the febrile ſtate. In all the patients in Mr. E.'s ſchool, and in Mr. W.'s family, where great variety in degrees of the diſeaſe occurred, I found the exhibition of acids extremely ſafe, ſalutary, and agreeable, and the recovery of the patients as expeditious, and their cure as complete, as by any other mode of practice. I have purſued the ſame plan in a great many other caſes. In the month of May laſt, I had the care of four young ladies, their mother, brother, and one maid-ſervant. The two eldeſt had each a ſmart attack of eruption, with angina ulceroſa and fever; one emetic, in the beginning, ſufficed for each; in one it anſwered, alſo, as a briſk cathartic. The other was obliged to take very active laxatives, certainly with advantage. Saline draughts, with vin. antim. were preſcribed the firſt two days, and followed by free perſpiration; then, decoct. cinch. cum acid. muriat.; the following ſirup in their common drink, acid. muriat ʒſs. acid. vitr. dil. ʒi. ſyr. facc. ℥ iv. and they were allowed wine whey, beef tea, and oranges. They were convaleſcent on the ſeventh day,

day, and experienced much leſs debility, languor, or the ordinary effects of fever, than uſually happen on ſimilar occaſions. This has alſo been uniformly the reſult in all the inſtances where this treatment was adopted. The mode of relief, by perſpiration, is well exemplified in the *throat diſtemper* above alluded to. The powder of ſnake-root, combined with aq. ammon. acet. & pulv. contrayerv. c., is, to my knowledge, an excellent medicine, calculated to produce perſpiration in caſes where the diſeaſe has made conſiderable progreſs, with dry ſkin, much fever, &c. Vid. Med. Obſerv. and Inquiries, ut ſupra.

The following inſtance is a good confirmation of the benefits which reſult from procuring perſpiration. In the year 1787, I viſited the daughter of a mantua-maker in the ſtrand, Miſs Richardſon, æt 13; it was the fourth day of the diſeaſe; ſhe had had an antimonial emetic on the third day, which had vomited and purged her freely; ſhe was taking a decoction of bark, with neutraliſed kali and tinctura ſerp virg.; pulſe 130, ſkin of deep red, and burning hot; face ſwelled; ſevere angina, with ſloughs, &c.; great oppreſſion of precordia; thirſt inſatiable. I ordered the patient to uſe a warm bath, to take a bolus with opium gr. ſs. pulv. jacobin. gr. iij. and apply a bliſter to the throat. The warm bath had completely relieved the ſymptoms, before the other applications were made; and ſo great

great was the amendment on the fifth, and ſo evident the good effects of the bath, that I have directed it's uſe in all ſimilar caſes, with equal good effect, from that time to the preſent. Where the warm bath cannot be procured, ſponging the body with warm or tepid vinegar is extremely refreſhing and ſalutary; inducing perſpiration early in the diſeaſe, by ſaline draughts and antimonials, abates exceſſive heat, and that extreme inflammatory ſtate of ſkin in ordinary caſes, which is painful and troubleſome to the patient. In a more advanced ſtage of the diſeaſe, with aggravated ſymptoms, an emetic being premiſed, the antimonials may be combined with contrayerv., vol. alkal., and camphor, which commonly induces diaphoreſis; and in this ſtate alſo the tepid vinegar ablution or warm bath are of excellent uſe. I am much inclined to imagine, that our endeavours to reduce the tenſion and heat of the ſkin is of great importance, in preventing the future acceſſion of anaſarca, which is ſo common a ſequel to ſcarlatina. This important meaſure having ſucceeded then, the early exhibition of tonics, mild or powerful, in proportion to the circumſtances of the caſe, conduces to the ſame deſirable end. The whole glandular and abſorbent ſyſtems are alſo relieved by the ſame means.

Although I have thought it my duty to warn the young and ſanguine practitioner againſt the promiſcuous

promiſcuous uſe of ſtrong and repeated emetics in all caſes of ſcarlatina anginoſa, I ſhould by no means think of interdicting their uſe in particular caſes; and the medical profeſſion is certainly indebted to Dr. Withering for proving their exhibition to be reſtrictively advantageous, where otherwiſe they would have been deemed pernicious and hurtful. At the ſame time that I know acids to be generally ſafe and uſeful, laxatives equally ſalutary and requiſite, and diaphoretics of the moſt eminent ſervice; in all which I do not agree with Dr. W., who allows, that he had never recommended the warm bath, and conſiders diaphoretics as uſeleſs: yet I am ready to confeſs, that alkalies and abſorbents may be highly proper, when the former are inadmiſſible; and hence it becomes the duty of every practitioner, to weigh ſeriouſly the individual circumſtances of each caſe, and to adapt his practice to theſe circumſtances. One ſuggeſtion on the adminiſtration of ſpecifics in general ſhall conclude what I have to offer on this part of my ſubject. No medicine ought to be deemed a ſpecific, which is not known to have certainly cured the diſeaſe, in all it's forms, in a very great number of well-authenticated caſes, atteſted under the eyes of phyſicians in a great variety of ſituations. In ſlight caſes, the effects may be neutral; in dangerous ones, life may be frequently ſacrificed by the too ready

and

and extenſive adoption of ſpecifics, and the too confident reliance upon them.

We ſhall now proceed to inquire, by what variety of modes the infection of ſcarlatina may be introduced into the human body.

However diverſified the *forms* of infection may be, all the modes, by which they can be imparted, are reducible to three: 1ſt, ſimple contact; 2, inoculation; 3d, inhalation.—1ſt, by ſimple contact. It is extremely doubtful, whether any acute contagion be communicated by ſimple contact alone. There is no poſitive proof with which I am acquainted, that even in thoſe infections in which the cuticle is ſeparated, or falls off in dry ſcales, as meaſles and ſcarlatina, or even where ſcabs are formed, as in ſmall pox, diſeaſe is communicated by *mere* contact. As the plague reſembles in it's mode of propagation every other acute infection, the facts relating to it's infective influence are applicable to all other diſeaſes of that claſs, and therefore it becomes a proper example for illuſtration. That the plague is not impartible by this mode is ſatisfactorily proved from the following citations. Mr. Howard made no ſcruple of going into the open air to the windward of a perſon ill of the plague, and feeling his pulſe. "The "infection in the air does not extend far from "the infected, but lurks chiefly to the leeward "of him. I am ſo aſſured of this fact, that I have "not ſcrupled going into the open air to wind-

"ward

" ward of a perſon ill of the plague and feeling " his pulſe." Howard on Lazarettoes, p. 25.

Dr. Ruſſell, who has given ſo accurate an account of the plague, who perſonally attended the ſick, and felt the pulſes of a great number, muſt have caught the diſeaſe, if mere contact was ſufficient to impart it. See his excellent Account of the Plague.

Mr. Aſſalini, a phyſician, and alſo ſurgeon of the firſt claſs to the Conſular Guard, in his Obſervations ſur la Maladie appellé Peſte, relates the following facts: " I ſhould have concluded, " that the diſeaſe in queſtion was contagious, " if I had ſeen, not only the French attacked " by the ſame malady, but alſo the Egyptians " and Syrians, with whom our ſoldiers held " continual intercourſe. As ſoon as one of our " ſoldiers was ſeized with the diſeaſe, two Turks " conducted or carried him to the hoſpital," p. 5. " After the death of ſeveral officers in " Jaffa, General Grezieu, Commandant of this " province, recommended to the Commiſſary of " War a native of the country, famous for " his treatment of the plague, and who agreed " to attend the ſick, under the inſpection of " a French ſurgeon. This man opened the " buboes indiſcriminately, and although his ſkill " in the art of healing was not extenſive, he " had for many years attended the inhabitants " of Jaffa, who were afflicted with it; and he " uſed

" uſed no precaution either to ſecure himſelf " from this diſeaſe, or to avoid contact with his " patients. I ſaw him ſtand with his naked " feet upon the bed of General Grezieu, who " was ſweating profuſely, take him by the arms " to change his poſture, although the General " was ſuffering under a carbuncle, of which he " died an hour afterwards. When he had " opened the buboes with his biſtory, and wiped " it with a piece of linen or lint, he placed it " between his forehead and his turban, and thus " paſſed from one patient to another, not only " in the hoſpital, but even in the town, and " did not return it into it's caſe until his viſits " were finiſhed. Citizens Deſgenette and Lar- " ray, the one Phyſician, the other Surgeon in " Chief to the Army of the Eaſt, as well as " many others of my colleagues, were not leſs " expoſed without inconvenience to the con- " tagion. Citizen Larray, in addition to the " operations requiſite in this diſeaſe, opened " different dead bodies, attentively examined " every part of them, principally the buboes " and the ſtate of the lymphatic glands, all of " which were, in general, more or leſs enlarged. " Citizen Deſgenette ſhowed me two punctures " which he had made upon himſelf in Syria " with a lancet, charged with the pus of a " bubo. He thus inoculated himſelf, being " perſuaded the diſeaſe was not contagious;

" but

" but both theſe learned and eminent men re-
" mained untainted and in good health." p. 8 and 9.

" Among the operations which are practiſed
" in theſe caſes, bleeding requires a nearer ap-
" proach than others to the perſon and bed of
" the patient; at leaſt this operation cannot
" be performed at a diſtance. With regard to
" myſelf, I bled patients in the uſual manner,
" without uſing *any other precaution than that
" of avoiding the breath of the ſick*; in opening
" an officer's bubo, the matter and corrupted
" blood guſhed out on the back of my hand."
" A young German, the wife of one of our ſol-
" diers, came to conſult me during my abſence;
" ſhe laid down upon my bed, and remained
" there a quarter of an hour. I went to viſit
" her the next day at her own houſe, and found
" her at the point of death." P. 12 and 13.

Sir R. Wilſon, after remarking, that the plague is local, ariſing from a corrupted ſtate of atmoſphere, and never introduced by contagion, adds in a note (page 242), " None contend
" that the plague is not, like all fevers, more
" or leſs infectious, according to the habit of
" body, and duration in bad air; but that the
" diſeaſe hangs only in the atmoſphere, or
" breath of the immediately afflicted patient,
" not to be conveyed by touch to a third
" perſon."

Although

Although it is evident from theſe facts, that the plague is not communicated by ſimple contact; yet the diſtinction between contagion and infection appears to me to be too nice, to be duly attended to in the ordinary intercourſe of ſociety. The idea of a diſeaſe not being contagious may induce many perſons to infringe the laws of prevention, who are unable to draw the line between contagion and infection. Authors having differed widely as to the acceptation of theſe terms, and no advantage having accrued from the diſcuſſion, nor any uſeful or true diſtinction, in fact, been made out between a contagious and an infectious diſeaſe, I have thought it moſt intelligible and conſiſtent with the truth to uſe them ſynonymouſly. Mr. Aſſalini coincides in opinion with Sir R. W. in the non-contagious nature of the plague; however, he alſo allows, that in order to avoid the peſtilence, it is abſolutely neceſſary not to inhale the *breath of the ſick*; thus virtually conceding the infectious influence of the plague, though, if I do not miſtake his meaning, he never directly allows it. He attributes his own ſafety, in a great meaſure, to this precaution, as he made it a rule never to expoſe himſelf to it, and practiſed perſonally every mode which could obviate even the prediſpoſition to, much more the actual aſſumption of the diſeaſe, with a degree of attention not to be exceeded by the ſtrongeſt advocate

cate for it's infectious powers, as appears from the following extract from the report prefixed to his work. " The preservative means, which " Mr. Assalini personally made use of, consisted " in remaining as short a time as possible in " unhealthy situations, making choice of as " wholesome food as could be procured, and in " occupying his mind, so as to exclude melan- " choly. He took care not to enter the hospital " in a perspiration, to drink before his visits a " cup of strong medicated coffee. On quitting " the hospital, he rode on horseback, so as to " induce perspiration, and drank hot punch at " bed-time, in order to produce abundantly the " same effect during the night. Independent " of these precautions, he never guarded himself " against the contact of the infected, and only " avoided *the direct reception of their breath*." (Rapport, &c. p. 10 and 11.)

But if it be granted, that the same disease with that under which one individual labours can be imparted in *any manner* to another, that disorder is unquestionably contagious. If, in order to escape the plague, the breath of the pestiferous cannot be inhaled with impunity, that great pest is thus undoubtedly allowed to be infectious.

The most useful and best conclusion which I can draw from an impartial review of these facts, is shortly this, that a degree of contact, which

medical attention to, and the nurſing of, the ſick, renders neceſſary, is perfectly innocuous; and that the eſtabliſhment of ſuch a fact, with regard to all infectious fevers, is of the utmoſt conſequence and the higheſt utility, as it would allay exceſſive fears, promote confidence, and give facility to the performance of the eſſential perſonal duties required by the afflicted, and to which affection and humanity are ever ready to prompt, wherever ideas of urgent danger do not repreſs the beſt feelings of the human mind. With this laudable and beneficent deſign have theſe authors declared their conviction. But while the motive deſerves our praiſe, the unqualified adoption of their opinion might prove extremely calamitous; and therefore it ought to be publicly and univerſally underſtood, that, except by near relatives and neceſſary attendants, contiguity ought in no inſtance to be permitted; and that the prohibition to common acquaintance and ſtrangers coming into contact with the diſeaſed ought to remain, as it is now, a ſolemn and indiſpenſable law of prevention. Becauſe it is to be feared, that by coming frequently and incautiouſly into contact with the infected, great danger of receiving their breath muſt be perpetually incurred; and it will be found, in the ſequel, a very neceſſary precaution in thoſe who attend infected perſons, carefully to guard againſt the reception of effluvia through the mouth and noſtrils; no length

of

of reſidence in tainted air can ſo far habituate the conſtitution to it's effects, as that a large doſe of poiſon, imbibed immediately through the noſtrils and mouth, may not be fatal.

We now come to the ſecond mode of giving infection, that by *inoculation.* Wherever a poiſonous morbific fluid, coming into contact with the true ſkin, is found to be capable of generating a diſeaſe preciſely the ſame with that from which itſelf was generated, this application is a true inoculation, whether it be inſerted by an artificial puncture, or accidentally applied where the cuticle is abraded. The diſeaſe ſo created is truly, and in the literal acceptation of the term, contagious. That the plague may be thus communicated, and is therefore contagious, Sir R. W. too truly teſtifies by the following melancholy relation: "Dr. White, an Engliſh phyſician, determined to diſcover if this malady, "ſo deſtructive to a large portion of the globe, "and which filled with apprehenſion the remainder, could not be checked or rendered "leſs virulent by the introduction of inoculation, reſolved to become the patient of his "own ſpeculation at Roſetta, during the time "the plague raged; *again* he inoculated himſelf with the matter taken from the buboes "of an infected perſon. The attempt failed "twice; the third proved fatal; in three days "after the ſymptoms appeared, he died, falling

"a much to be lamented victim to a diſin-
"terefted zeal," &c. (p. 246). This fact alone ought to remove all thoſe doubts concerning the true nature of the plague, which theſe reſpectable authors have revived after a long oblivion; nor ſhould an additional impetus be given to it's too deſtructive progreſs, by attempting to prove, that the uſual preventive reſtrictions are uſeleſs and nugatory. In Dr. Ruſſel's excellent Treatiſe on the Plague, the reader will ſee all the arguments for it's non-infectious nature ably refuted. Since his time, ſee alſo Antis and Wittman. "There is no inſtance
"of any European or others having caught the
"infection, who began and performed a ſtrict
"quarantine in due time; but many perſons,
"who have had the imprudence to take but a
"ſingle ounce of ſilk, or a handkerchief, from
"without, have loſt their lives by it, of which
"I have ſeen ſome remarkable inſtances." Antis's Obſervations on Egypt, p. 35.

Inoculation of the ſmall pox was originally introduced with the beneficent intention of leſſening the malignity of that peſt, and reſtraining it's infectious influence. But ſad experience has fatally evinced, that it's ravages have been greatly extended by this mode of imparting it's infection. The ſame conſequences will enſue from the ſame mode of communicating the poiſon of the plague and ſcarlet fever, which

ingenious

ingenious well-intentioned men have in ſerious contemplation to execute. But I ſincerely hope and truſt, that the practice of inoculating virulent morbid poiſons into the healthy body, and thus wantonly ſpreading contagion and mortality through ſociety, will, in every inſtance, be zealouſly and firmly oppoſed by the friends of humanity in general, and the enlightened members of the profeſſion in particular. As inoculation is a voluntary mode of infecting the human ſubject, and that by ſimple contact does not take place, the third mode, by inhalation of infectious vapours, appears to be the only ſpontaneous one of imparting contagion. But it will be made evident in the courſe of theſe pages, that infectious vapours, of every deſcription, can only exiſt in certain degrees of temperature; conſequently, that being always neceſſarily in a gaſeous form, their moſt eaſy and perhaps ſole admiſſion into the human frame, muſt be through the noſtrils and the mouth. Their entrance by ſimple contact, or through the ſkin, muſt be extremely difficult, if not impoſſible; for if contagious matter, or perſpiration, are not infectious when applied to the ſkin in handling and feeling the pulſes of the patients, bleeding and opening abſceſſes, the contents of which infect by inoculation, it is not to be imagined, that vapours ſhould infect by cuticular abſorption. Upon the ſame principle, in-

fected clothes or fomites thence arising, do not infect by simple contact, they can only impart infection under that degree of temperature, in which the miasms they have imbibed assume the form of vapour; this fact will also be substantiated in the sequel. But in the mean time it is worthy of remark, that fomites must be considerably impregnated with the effluvia ere they can become infectious, and that it requires some length of time to effect such impregnation. Hence I conclude, that the clothes of medical men are seldom or never imbued with contagion; and that the short repose which the patient, labouring under the plague, took on Mr. Assalini's bed, allowed no time for absorption. Fomites being once fully charged with miasms, and closed up from access of air, may convey infection to any distance, or at any season of the year, even in the coldest, when by their exposure to artificial heat their miasms are converted into vapour. This is one very material circumstance, which ought not to be overlooked when acute contagions appear at unusual times, or under circumstances difficult to explain. We may observe, that vapour, being the only form in which infection can be received, and inhalation of this by the mouth and nostrils being the only mode of access into the constitution, variations in the time of sickening and the occurrence of symptoms will be readily, and by no

forced

forced conſtruction, accounted for. Infectious effluvia may be propagated along the olfactory nerves immediately to the brain, or paſs through the mouth into the ſtomach, or be gradually admitted into the circulation through the medium of the lungs. In the firſt caſe, ſudden death or rapid aſſumption of diſeaſe, commencing with ſymptoms of injured brain, followed by ſickneſs, as a conſequence of the previous affection of that organ, takes place. In the ſecond caſe, ſickneſs, or purging, or both, will be the *primary* ſymptoms, followed by vertigo, head-ach, delirium, &c. In the third caſe, the more gradual approach of fever, in a milder form, is clearly to be diſcerned, and the poiſon is then ſaid to be dormant, or to be latent in the conſtitution. That theſe different gradations in the violence and the ſucceſſive progreſs of ſymptoms actually happen, is proved by the following quotations: "Several of the ſeapoys of the Indian army "in Egypt, and others, ſeemed to ſink under "the firſt impreſſion of the contagion. Their at-"tack being ſudden, inſtantaneous, and violent, "I was told, that ſeveral dropped down in their "ranks, and died within a few hours afterwards." Wittman, p. 516. Journ. of the Plague. In the firſt claſs of Dr. Ruſſel's diviſion of the plague, the ſymptoms which he there enumerates, mark the primary *cerebral* affection alluded to: "Sudden proſtration of ſtrength, confuſion and

" weight in the head, giddineſs, oppreſſion of " precordia, dejection of ſpirits, inclination to " ſilence; *febrile ſymptoms* none, or very ob- " ſcure; theſe patients periſhed in xxiv hours; " ſometimes the ſecond or third day they had " neither buboes nor carbuncles. In ſome, " having the above ſymptoms, in a few hours " the eyes became muddy, ſkin cold, were de- " prived of ſpeech, drowſy, lethargic, pain in " the heart, by turns delirious, confuſed, and " ſenſible. Some had vomiting the firſt night; " in others, a diarrhœa ſupervened the next day; " both or either accelerating the fatal period. " Buboes appeared in none, except in a very " few, who ſurvived the third day," p. 96, 97. Ruſſel. The ſymptoms, which ſeem to indicate the ſtomach to be primarily affected, are thus recited in the ſecond claſs: " The diſeaſe " began with ſlight ſhivering, ſucceeded by " fever, with giddineſs, head-ach, vomiting, " ſometimes looſeneſs;" then followed ſymptoms of affected brain; delirium or coma, fluſhing of face; but the moſt characteriſtic ſign of affected ſtomach in this claſs was " *the burning* " *pain at the pit of the ſtomach and inceſſant in-* " *quietude.*" " The third claſs is only diſtin- " guiſhed from the ſecond by the total abſence " of vomiting at the acceſſion." The other ſymptoms, being ſimilar to thoſe of the firſt claſs, clearly denote the brain to be the ſeat of pri-

mary impreſſion; and the following inſtances, related by Dr. Lind, decidedly indicate, by their diſtinct effects, the particular organs to which poiſonous vapours are applied, and that paludal exhalations induce ſimilar conſequences with thoſe of contagious human effluvia.

" The marines, who were three times a week " exerciſed early in the morning on South Sea " Beach, near Portſmouth, from the effect of " the ſtagnant water of an adjoining moraſs, " ſuffered much. Half a dozen of them at a " time were frequently taken ill in their ranks, " when under arms; ſome being ſeized with " ſuch a giddineſs in their head, that they could " ſcarcely ſtand, while others fell down ſpeech- " leſs, and upon recovering their ſenſes, com- " plained of a violent head-ach." (Lind, on Hot Climates, p. 23.

" I am informed by a ſurgeon, who practiſed " ſome years at Senegal, that for ſeveral months " during the dry ſeaſon, the country was as " healthy and pleaſant as any in the world, but " ſoon after the rainy ſeaſon began, a low ma- " lignant fever conſtantly ſpread itſelf among " the Europeans. It ſeemed to proceed from a " poiſon, as it were, got into the ſtomach, be- " ginning with ſevere retchings, and often " vomiting of bile. In the month of June, " almoſt two thirds of the white people were " taken ill; their ſickneſs could not well be " cha-

" characteriſed by any denomination commonly " applied to fevers: it, however, approached " neareſt to what is called a *nervous fever*, &c.; " the brain and nerves were principally affected. " It had alſo a tendency to frequent remiſſions. " It began ſometimes with a *vomiting*, but " oftener with a *delirium*." Lind, p. 70.

" Some perſons became dull, inactive, or " ſlightly delirious at intervals: without being " ſo much as confined to their beds, they ex- " pired in that delirious or comatoſe ſtate, in " leſs than forty-eight hours, after being in " apparent good health." Malignant Fever. Caoutchou. Ib. p. 72.

From theſe ſtriking facts, Dr. Lind himſelf concluded, that the poiſon which generates the fevers of the remittent type, affects the head and ſtomach. Dr. Johnſtone, of Kidderminſter, alſo thinks, that the poiſonous effluvia are taken into the ſtomach. Page 63, Malignant Fever. Anno 1756.

A greater number and variety of proofs of ſimilar tendency with the above, might be eaſily adduced, but the ſubſequent relations ſo diſtinctly mark the direct effects of the contagious effluvia of ſcarlatina in one inſtance, and of marſh miaſmata in the other, that I cannot withhold the recital of them. They alſo lead to the concluſion, that poiſonous pyrexial gaſes, human or paludal, may be ſo virulent and concentrated,

as

as to excite that ſpecies of eryſipelatous or carbuncular inflammation which quickly ends in gangrene; hence we can account for the delirium, the dull red eye, &c., from this inflammation attacking the brain in the plague, in the typhus and in the remittent fevers of hot climates, as alſo the burning pain at the pit of the ſtomach in the plague, the yellow and remittent fevers of the Eaſt and Weſt Indies; and explain the reaſon why nurſes and others, who have frequently been expoſed to contagious or paludal gaſes with impunity, or have become gradually inured to an atmoſphere tainted with theſe noxious vapours, ſo as to reſiſt the gradual aſſaults of milder infection, are often ſuddenly deſtroyed by the immediate accidental application of more virulent concentrated poiſons, admitted directly to the brain or ſtomach. This may account for the fatal termination of the god-like labours of the much-lamented Howard, after eſcaping ſo frequently the ſhafts of contagion.

"Divi Franciſci Cuſtos, vir doctrina et moribus inſignis, hac lue obſeſſus, tonſillas ſolummodo et gargareonem inflammatione læſa habebat, et continuo querebatur ſe percipere in ore fœtorem quendam; et ut hac de re certior redderetur, ad ſe vocavit baccalaureum quendam ſibi amiciſſimum, qui maximo affectu aſſiſtebat, rogavitque ut vellet olfacere, percipereque

" cipereque naribus, an verum eſſet talem " fœtorem emittere, an ab ejus imaginatione " prodiret. Olfecit baccalaureus, me (ſcil. Cor- " teſio) præſente, et multis aliis: at ſtatim non " multis elapſit horis decubuit ſola faucium et " glandularum inflammatione vexatus, abſque " aliqua manifeſta corruptione partium, omni- " buſque præſidiis ex arte factis, quarto die " ſuffocatus periit; et tamen cuſtodem non teti- " gerat, ſed ſolo olfactu aerem ab ore prodeun- " tem naribus traxerat: quare ab hujuſmodi " exemplo veni in ſententiam hunc morbum " non eſſe abſque aliquâ contagione." (Corteſii Miſcellanea Medica, p. 698, quoted from Dr. Fothergill, on Sore Throat, p. 7.)

" When the Lion, Spence, and ſeveral other " ſhips of war, were employed at Port Antonio, " in the Iſland of Jamaica, in clearing Navy " Iſland of wood, in order to build wharfs and " ſtore-houſes in that place, many of the men, " when cutting down the wood, were ſeized at " once with a fever and delirium; this phrenſy " attacked a man ſo ſuddenly, and with ſuch " fury, that with his hatchet he would have cut " to pieces the perſons who ſtood near him." (Lind on Hot Climates, page 228.)

From the whole of the facts, and reaſoning on the mode in which contagion can be induced, it ſeems evident that the introduction of infectious particles into the human body by ſimple con-

contact is impoſſible, and inoculation is a voluntary act. If, then, it can be aſcertained, that infectious vapours can only exiſt under certain degrees of temperature; that the only avenues through which they can enter the body, are thoſe of the noſtrils and the mouth; and, conſequently, that to guard againſt the communication of infection through theſe channels, is the principal, or only neceſſary precaution: the means of prevention may then be reduced to the moſt ſimple, intelligible, and practical execution, which it will be in every one's power to adopt.

PART

PART II.

Of Infection, or Contagion in general.

HAVING adduced evidence ſufficient to prove, that the propagation of ſcarlet fever may be arreſted, and it's local extinction completed by the ſame means as are ſucceſsfully employed in deſtroying other contagions, I conclude another dangerous diſeaſe may be conſidered as deducted from the number of thoſe which are deemed inevitable.

It will not, I truſt, be denied, that every ſucceſsful effort to limit the extent of one infectious diſeaſe, brings us one ſtep nearer to the ſuppreſſion of another, and will, if firmly purſued, ultimately, though gradually, conduct us to the extinction, or, at leaſt, the ſuſpenſion and limitation of all contagious diſeaſe*.

To this great object my wiſhes and labours are earneſtly directed, and with this ſole view have

* This idea is not new; Dr. Haygarth, alluding to the practice of prevention, obſerves, that, "as far as we yet "know, it may be applied in *all infectious diſtempers.*" P. 83. Letter to Percival.

I pre-

I preſumed to offer the following obſervations upon every kind of contagion.

The purity of the motive may, I hope, claim ſome indulgence for the deficiency of the attempt; and though I may be found to have fallen below my aim, I ſhall, at leaſt, derive ſome ſatisfaction from having, according to my ability, endeavoured to diminiſh the weight of human woe.

That the ſame animal body ſhould be made capable of generating diſeaſes ſo various in their forms and different in their effects, as are thoſe of the infectious claſſes, is one of the moſt awful inſtances of the Creator's power, and one of the moſt intereſting ſubjects of human inquiry. Inviſible and myſterious in their origin, terribly deſtructive in their progreſs, in their termination ſudden and unforeſeen, certain contagions have appeared as the immediate and dreadful viſitations of Heaven. The impreſſion is by no means unnatural with regard to infections of the higher degree of malignity, the rapidity and fatality of which have repelled every effort of ſkill, appalled the courage of the moſt intrepid, and eluded the vigilance of the moſt guarded. But we may be juſtly ſurpriſed at the weakneſs of human concluſions, when we ſee that thoſe of inferior fatality are become the ſubjects of daily occurrence, and are paſſively endured

endured as inevitable evils, which all are fated to experience.

Of this description are the small-pox, measles, hooping-cough, &c. The zeal of some intelligent and real, though, in this instance, mistaken friends to humanity, would add the scarlet fever and the plague to the number, by introducing the inoculation of those pests. No plan being so effectual in restraining the calamitous effects of contagion as that of *prevention*, none can so strongly militate against it's success as the inoculation of virulent infectious poisons. The pernicious tendency, therefore, of such schemes, will, I trust, be easily discovered, and themselves as readily quashed. The inoculation of the cow-pox is evidently an exception, since it substitutes a mild affection in the place of a virulent, malignant disease, and is itself one principal mode of prevention. When variolous inoculation was introduced into this country, satisfactory proofs were not, as they are now, established, that the progressive influence of some of these minor pests, viz. small-pox, typhus, scarlet fever, &c., is not invincible, when properly opposed; and that the necessity of submitting to their infliction is not imposed upon mankind as the irremediable attendant on his lot.

The ravages of that disease, named from it's irresistible and impetuous force, the plague, to which

which the Turks and Egyptians annually ſubmit, as to the decrees of fate, having been extended, at different periods, to England, France, &c., theſe powers eſtabliſhed by law, the means of prevention, by enjoining the performance of quarantine; a regulation calculated, not only to arreſt the progreſs of immediate calamity, but to prevent the recurrence of a ſcourge, which threatened to depopulate thoſe nations. By this ſingle grand expedient, the peſtilence has been generally excluded whereſoever this practice has been duly enforced. Highly beneficial and obvious as the general adoption of ſuch a meaſure might ſeem, in caſes of ordinary infection, it has been ſtrangely diſregarded. Theſe, indeed, being leſs terrific, and leſs rapid in their courſe, but ſcarcely leſs deſtructive in their final effects, have long been ſuffered to diminiſh our population, and prey upon the comforts of ſocial life, with an apathy hardly to be conceived in an enlightened nation, famed for it's humanity. The brave defenders of our country, invincible to all other enemies, have been too frequently ſubdued by theſe. (Vide Lind's Eſſay on Hot Climates; Sir J. Pringle's Diſeaſes of the Army; &c.) Thouſands have periſhed by the ſword, but the diſeaſes of the camp, the garriſon, and the intemperate climes, multiplied by contagion, have ſlain their tens of thouſands. Even in expeditions of diſcovery, one principal object of

which was, to inſtruct the unenlightened ſavage, and render to him the bleſſings of civilization, a foul and infectious diſeaſe has been communicated, far outweighing the intended good. The bane being left without it's antidote, it may eaſily be conceived what calamity muſt aſſail thoſe once happy iſlanders who have received this curſe. How often has the ſmall-pox been imported into our colonies! what havock has it not occaſioned in thoſe fervid climes! In the preſent time, I truſt, no ſuch events will be allowed to diſgrace the Britiſh character, and defeat the benevolent purpoſes of ſimilar expeditions.

Epidemic and infectious fevers have, at various periods, afflicted, more or leſs extenſively, the inhabitants of certain diſtricts in this country; within theſe few years they have, from cauſes well known, alarmingly increaſed among the poor eſpecially, in almoſt every province of the kingdom. They have, in many inſtances, entered the dwellings of the opulent, and if their progreſs is not vigouroufly reſiſted, they will continue to multiply to a more formidable extent. Infectious fevers had become ſo general in ſome of the large manufacturing towns, as to excite the particular attention, and call forth the ſtrenuous exertions of the phyſicians ſuperintending the diſpenſaries and hoſpitals of theſe places. Dr. Haygarth, having firſt applied the

rules

rules of prevention, with equal acuteneſs and ſucceſs, to the local ſuppreſſion of variolous contagion, extended their beneficial operation to that of typhus and ſcarlet fever. Many other eminent provincial phyſicians followed this laudable example, with honour to themſelves and advantage to the public. The capital has, at length, adopted the ſame beneficent plan, with regard to low contagious fever. The infant inſtitution, eſtabliſhed with ſo noble and humane a deſign, cannot be too ſtrongly, too frequently recommended to the foſtering hands of the wealthy and benevolent.

Another inſtitution, for the total extirpation of ſmall-pox, is at this moment founded. Let theſe god-like attempts to annihilate ſuch direful ſcourges of mankind, be extended to their utmoſt practicable limits. Let the application of what is partially adopted become univerſal. Increaſe the number of the columns; amplify it's extent; enlarge it's boundaries; increaſe it's altitude, till the noble, majeſtic edifice be complete.

Being convinced that an enlarged ſcheme of prevention may be made to comprehend *all* infectious diſeaſes, I am anxious to impreſs this great truth on the public mind, at the preſent moment, when it is deeply and laudably engaged on the actual extinction of *one* of them. *

* viz. The ſmall pox.

Even in the execution of this ſingle purpoſe, the united exertions of the legiſlature and the faculty muſt be zealouſly exerted, and no more will be required in extending the plan ſo univerſally as to produce incalculable benefits, and cut off the ſources of the moſt numerous and ſevere calamities of the ſocial ſtate. All contagions, of whatever deſcription, are governed by one and the ſame rule in their tranſmiſſion from one individual to another; they are communicated by the ſame means, viz. by perſonal and intermediate intercourſe; they are all ſuſpended or annihilated by the ſame modes, viz. by the limited interdiction of that intercourſe.

Every ſpecies of contagion being ſuppreſſible by the temporary reſtriction of perſonal and intermediate communication, it follows, that the ſame reſtrictions are as practicable in all inſtances as in any ſingle example. It cannot be denied, therefore, that the means of ſuſpending the progreſs, or of locally annihilating all contagions, are as much in our power as the extinction of one.

In the execution of a project ſo comprehenſive as that which involves the ſuppreſſion of every contagion, many obſtacles will undoubtedly ariſe, which may, at firſt ſight, appear inſuperable. Similar objections have ever been oppoſed to every effort to meliorate the condition of man; but they have been moſt frequently overcome. Their oppoſition, on the preſent

preſent occaſion, will not be more obſtinate in an extended, than in the limited plan, which is about to be put into execution. Great and numerous as the difficulties appear to be, they may all be included under the ignorance, the ſelf-intereſt, and the indolence of human creatures. Ignorance on a ſubject of ſuch high importance need not be ſuffered to remain long, where the means of information are ſo readily diffuſed as at the preſent æra, and the arm of the law can never be more properly called forth to lend it's aid, than where ſelfiſhneſs, indolence, or inſenſibility to moral inducements are oppoſed to meaſures of undoubted public utility. No infringement on the genuine liberties of the ſubject is, on this occaſion, propoſed. In the inſtance of quarantine, men are obliged by law, to ſubmit to reſtraints, which may tranſiently injure their intereſts, and interrupt, for a time, their ſocial enjoyments; the more varied and extenſive application of theſe laws is all that is required. There can be no good reaſon why the ſame reſtrictions may not be enforced, where the ſtake is of equal magnitude, though the danger does not appear ſo immediate. Be it well imprinted on every one's mind, that all infectious diſeaſes are peſts, only inferiour in the rapidity, the degree, and the urgency of their conſequences, to that ſurnamed the plague, from it's ſuppoſed preeminent fatality. Patience, firmneſs, and

perſeverance, as in all other inſtances of evidently promoting public advantage, will gradually overcome prejudice, unreaſonable fears, and ſelfiſh oppoſition*. In proportion as plans of prevention become more known and more practiſed, the great ends of their adoption will be more eaſily attained, and their beneficial tendency more fully comprehended. The contagion of typhus, ſmall-pox, and ſcarlet fever, being known to be capable of complete intervention and local extinction, the tranſition from controlling theſe forms of contagion to that of repreſſing others, as hooping cough, meaſles, &c. will appear eaſy and practicable.

A more forcible objection, however, and of a different character from the foregoing, remains to be obviated. Every ſpecies of infection muſt have had an origin. The ſame cauſe or cauſes which gave birth to a given contagious diſeaſe, in one or more individuals who firſt experienced

* "A buſineſs of this kind will go on but ſlowly, and ſometimes ſeem to have a final ſtop put to it, not only from it's magnitude, but from indolence, prejudice, intereſt, envy, and wrongheadedneſs. This common fate of all great and new undertakings ſhould never diſcourage the adviſer from perſevering; for every uſeful truth, fairly laid before the world, however it may ſeem, at firſt, to be ſlighted, will gradually undermine the old errours, and, in time, prevail over all oppoſition."

See the late Dr. Heberden's letter, annexed to the ſecond edition of the Enquiry how to prevent Small-pox.

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it, will operate again under ſimilar circumſtances, and reproduce the ſame diſeaſe occaſionally, notwithſtanding the moſt ſucceſsful attempts to extirpate it at any particular time. Allowing this objection it's utmoſt force, the advantages will be infinitely great where prevention is inſtantly adopted, whenever ſuch examples of original contagion occur, compared with the conſequences which enſue, where no precautions are uſed. In ſupport of this argument, a ſtriking inſtance of the advantages of voluntary ſecluſion appears in it's ſecuring the health of the merchants of the Levant, in their factories, while the plague is deſtroying numbers all round them, no meaſures being taken by the people of the country to prevent it's propagation.

The ſuppreſſion of ſcarlet fever in a ſchool at Cheſter, and at Mr. E.'s ſeminary, by the means of prevention, compared with the diffuſion of the ſame diſeaſe in another ſchool at Cheſter, page 4, *ſupra*, where no precautions appear to have been taken, aſcertains the efficacy and practicability of preventive meaſures beyond all doubt. Several additional inſtances are given in Dr. Clark's Collection, p. 28, 30, 64, 68.

This practice being equally facile and intelligible in every inſtance, we may entertain the beſt founded hopes, that it's advantages will be

increaſed in proportion to the univerſality of it's application; and that we have every inducement to exert our beſt endeavours to complete the ſimple and beneficent plan of *prevention*.

But the argument in favour of univerſal prevention becomes irrefragable, if the primary and principal ſources of contagion can be diſcovered, and are then capable of being obviated or removed. With this view, a cloſer inſpection into the origin of acute contagions in general may be inſtituted with advantage, which ſhall now be curſorily attempted, leaving to more able hands the completion of a reſearch, than which none involves more extenſively or more cloſely the deareſt intereſts of our fellow creatures.

The origin of contagious diſeaſes has been commonly deemed ſo obſcure, that any attempt to elucidate the ſubject would appear more curious than uſeful, more theoretical than practical, could it not be proved, that a more accurate acquaintance with infectious ſources would moſt eſſentially promote that extenſive plan for the extirpation of this claſs of diſeaſes, which I am ſo anxious to recommend.

We ſhall obtain the cleareſt view of our ſubject, by dividing all infectious diſeaſes into the acute and the chronic. The firſt head alone ſhall occupy our attention at preſent, and under it are comprehended—the *plague*, or *bubonary* fever;

fever; the *variolous*, *morbillous*, *ſcarlet*, and *yellow* fevers; and the *jail*, *hoſpital*, *putrid*, *low*, *nervous*, *malignant*, or *typhous* fever.

In taking this enlarged ſurvey of every deſcription of infectious fever, I ſhall endeavour to eſtabliſh the following poſitions on as ſolid a foundation as the difficult nature of the inquiry will permit, and apply them as cloſely as poſſible to the main point, which is the univerſal ſuppreſſion of acute contagions.

1ſt, *Certain exhalations, or marſh miaſmata, as they are uſually termed, have the peculiar effect of inducing fever on human bodies, expoſed, in certain conditions, to their influence.* From their denomination it is too commonly underſtood, that marſhes are the only ſources whence theſe exhalations ariſe. But they alſo proceed from moiſt earth, ſlime, mire, or mud, in a great variety of ſituations and climates, of inhabited as well as unfrequented and uncultivated tracts of country, in almoſt every quarter of the globe. They are more powerful, concentrated, and virulent in hot climates and in hot ſeaſons, than in temperate ones. And it appears, that the types, or periodical evolutions of the fever which they excite, are chiefly governed by the degrees of concentration, which theſe exhalations poſſeſs. The type being more continued, and leſs intermittent or remittent, in proportion to the power of the exhalation, animal

febrile

febrile effluvia, *cæteris paribus*, produce fever ſimilar in type, in degree, and violence, to the ſtrongeſt paludal exhalations.

Although authors have ſo divided and treated of theſe gradations of fever, which they have denominated types, as to lead to the idea of their being diſtinct diſeaſes, the only true conception to be entertained concerning them is, that they merely mark the duration and the degree of the ſame diſeaſe, or that the febrile character itſelf is always identical, and retains it's individuality, in every inſtance, under great varieties of type. For fever of every degree of violence, and of every evolutionary ſhape, is known to be induced by marſh miaſmata, from the ſimple ague, generated in the Hundreds of Eſſex, to the malignant pyrexial offspring of the banks of the Senegal. The following obſervations (which are ſtated, in proof of the identity of fever, and which were made by Sir J. Pringle* on the epidemic of the Army of the Netherlands) will apply in ſupport of the ſame truth, to every other part of the world, where fever is generated.

" The epidemic of autumn and prevailing " diſtemper of this and other marſhy countries, " is a fever of an intermitting nature, commonly " of a tertian form, but of a bad kind, which, " in the dampeſt places and worſt ſeaſons, ap-

* See alſo p. 187, § 4. Pringle's Diſeaſes of the Army.

" pears

" pears as a double tertian, a remitting, or an ar-
" dent fever. But, however theſe fevers may vary
" in their appearance, according to difference
" of conſtitution and other circumſtances, they
" are all of a *ſimilar nature*; for, though in the
" beginning of epidemics, when the heat, or
" rather the putrefaction in the air, is greateſt*,
" they aſſume a continued or remittent form,
" yet, by the end of autumn, they generally
" terminate in intermittents." Diſ. of Low Countries, p. 7.

The ardent fever above-mentioned is thus deſcribed by the ſame faithful and accurate obſerver; and it is impoſſible to avoid remarking the ſtrong reſemblance, or rather identity of character, which ſubſiſts between this, the yellow fever, and even the plague. This identity is alſo confirmed by the certainty, that they all own one common origin, viz. marſh miaſmata. " The ſummer had been hitherto warm; but
" throughout July and Auguſt, when the ſick-
" neſs was greateſt, we had no rain, the air was
" cloſe and ſultry. Near the inundations, the
" nocturnal fogs were thick and fetid. The firſt
" worſt appearance of the epidemic was in the
" form of ardent fever. The men were ſuddenly
" ſeized with violent head-ach, and frequently
" with delirium. If ſenſible, they alſo com-

* *i. e.* When the miaſmata are moſt powerful and concentrated,

" plained

" plained of grievous pains in their backs and " loins; of intenſe thirſt and a burning heat; " with ſickneſs and oppreſſion at the ſtomach, " or with retching and vomiting of bile; " others had an evacuation of bile by ſtool, " with a teneſmus and pain in the bowels." Yellowneſs is alſo mentioned in another place as an attendant on this fever; it is the product of certain ſeaſons, *vide* note by Huck. * But it is highly important to obſerve, that marſhes and ſwamps are far from being the only ſources of miaſmata, hereafter, perhaps, more juſtly named paludal febrilizing gaſes. The moiſt ſlime and mud on the borders of ſtagnant lakes, on the banks of great rivers and of mill ponds; the mire and mud in the unpaved ſtreets, ditches, lanes, and paſſages of great towns and cities, villages, &c., particularly the cellars and damp abodes, where the pooreſt claſſes are moſt frequently doomed to dwell; and the moats, which ſurround ſome of our priſons, or thoſe of garriſons, &c., all yield febrilizing exhalations. The ſoil where certain hoſpitals, barracks, or encampments are ſituate; the wells and cellars, damp cells and dungeons of priſons, and the holds of ſhips, are all calculated to emit pyrexial effluvia from the moiſt earth or mud, and filth, which are moſt commonly to be found within their precincts, which, if they are not carefully and

* In Sir John Pringle.

frequently

frequently cleanſed and ventilated, are liable to accumulate there. Woody half-cleared diſtricts give out gaſes of ſimilar properties.

The following quotations will, I preſume, fully demonſtrate the truth of theſe aſſertions. To the medical reader they may appear ſuperfluous, but to the general ſtudent they will tend to convey a body of evidence more ſatisfactory than ſcattered facts can poſſibly be made to eſtabliſh.

"The years 1765 and 1766 were diſtinguiſhed "by an uncommon appearance of intermitting "and remitting fevers in moſt parts of England. "One obvious cauſe was the unuſual frequency "of the Eaſterly wind.

"An Eaſt wind in England is ſaid often to "bring with it a fog from the ſea, but the truth "of the matter is, that this wind, in many places "of the iſland, frequently raiſes a copious vapour "from the water, *mud, and all marſhy or damp* "*places.*" (Lind on Hot Climates, p. 18.)

"In particular ſpots of the *low damp* iſland of "Portſea, the ague frequently prevails, and ſome-"times the flux, during the autumnal ſeaſon; "in ſome years they are much more frequent "and violent than in others; it is obſervable, "that their attack proves always moſt ſevere to "ſtrangers, or thoſe who have formerly lived "on a dryer ſoil, and on a more elevated ſitu-"ation.

"The

"The year 1765 was remarkable, not only for "the long continuance of eaſterly winds, but "alſo for an exceſſive degree of heat, which pro- "duced a more violent and general rage of thoſe "diſeaſes than had been known for many "years. During the months of May, June, "and July, we had ſeldom fewer at Haſlar Hoſ- "pital than thirty or forty patients, labouring "under the *regular tertian agues*, with *regular* "*intermiſſions*. Of theſe, ſome were ſeized with "it on board the guard ſhips, that lay in the "harbour, *near the mud*, &c." Page 21, *ibid.*

"A conſiderable part of the town of Kidder- "minſter is built acroſs ſome *low*, *marſhy*, and "*boggy ground*, which extends itſelf from N. to "S. for ſeveral miles above and below the town; "theſe low grounds are frequently overflowed by "the ſwelling of the river Stour, which runs "ſlowly in the ſame direction, and empties itſelf "three miles S. of us into the Severn. The ſtag- "nating water, left by theſe inundations, riſing "into the air in *putrid moiſt vapours*, and blow- "ing full upon the inhabitants of the town by "the S.W. and N. winds, cannot but cooperate "with a long courſe of *moiſt* and *rainy* weather, "in producing putrid malignant diſorders. In "fact, this place has been remarkably liable to "ſuch diſorders long before I became acquainted "with it as well as ſince." (Jonſtone's Hiſtory of

of the Epidemic Malignant Fever of the Year 1756, page 1).

The following quotation is well worthy of attention, both as demonſtrating the general influence of paludal effluvia, and alſo rationally diſplaying the cauſes of the increaſe in the number and malignity of the fevers, which have of late years infeſted ſeveral parts of the American territory.

" It has been obſerved, that Pennſylvania is " now more unhealthy than formerly; that bili- " ous and remitting fevers, which a few years " ago appeared chiefly in the neighbourhood of " rivers, creeks, and mill-ponds, now appear " in parts remote from them all, and in the " higheſt ſituations.

" This change has been traced to three " cauſes.

" 1ſt. To the increaſe of mill-ponds. Till " theſe were eſtabliſhed, intermittents in ſeveral " counties in Pennſylvania were unknown.

" 2dly. To the clearing the country. It " has been remarked, that intermittents on the " ſhores of the Suſquehannah, have kept pace " with the paſſages which have been opened for " the propagation of marſh effluvia, by cutting " down the wood which formerly grew in it's " neighbourhood; a diſtinction, however, is to " be made between clearing and cultivating a " country. While clearing a country makes it

" ſickly,

" ſickly, in the manner that has been men-
" tioned, cultivating a country, that is drain-
" ing ſwamps, deſtroying weeds, burning bruſh-
" wood, and exhaling the unwholeſome and
" ſuperfluous moiſture of the earth, by means
" of frequent crops of grain, graſſes, and vege-
" tables of all kinds, renders it healthy. Seve-
" ral parts of the United States of America
" have paſſed through the ſeveral ſtages that
" have been deſcribed. The firſt ſettlers received
" their country from the hand of Nature, pure
" and healthy. Fevers ſoon followed their im-
" provements, nor were they finally baniſhed,
" until the higher degrees of cultivation took
" place, nor even then, where the ſalutary
" effects of cultivation were rendered abortive
" by the neighbourhood of mill ponds.

" As a 3d cauſe of this increaſe of fevers,
" the unequal quantities of rain which have
" fallen of late years have been aſſigned. While
" the creeks and rivers were confined within
" ſteady bounds, there was little or no exhala-
" tion of febrile miaſmata from their ſhores.
" But the dry ſummers of 1780, 1781, and
" 1782, by reducing the rivers and creeks far
" below their ancient marks; while the wet
" ſprings of 1784 and 1785, by ſwelling them
" beyond their natural heights, have when they
" have fallen, as in the former caſe, left a large
" and extenſive ſurface of moiſt ground, ex-

" poſed

" poſed to the action of the ſun, and of courſe " to the generation and exhalation of *febrile* " *miaſmata.*" (Morſe's American Geography, p. 310.)

" In the Eaſt Indies, and in the Southern " parts of Aſia in general, we find that the " countries which are well improved by human " induſtry and culture, ſuch as China, and " ſeveral other places in that part of the world, " are bleſſed with a temperate and pure air, " ſalutary to the European conſtitution. On " the other hand, the woody and uncultivated " parts, ſuch as the iſland of Borneo, Java, " and Sumatra, the coaſts of Arakan and Pegu, " the iſlands of Negrais, where the Engliſh " lately attempted to make a ſettlement, Banda, " one of the Dutch Spice Iſlands, and ſeveral " others, have proved fatal to a multitude of " Europeans, and others who have been accuſ- " tomed to breathe a purer air.

" In all ſpots of the Eaſt Indies, ſituated near " *large ſwamps*, on the *muddy banks of rivers*, " or *the foul ſhores of the ſea*, the vapours ex- " haling from the putrid ſtagnated water, either " freſh or ſalt, from the corrupted vegetables, " and other impurities, produce mortal diſeaſes, " eſpecially during the *rainy ſeaſon.* There is " a place near Indrapour, in Sumatra, where " no European can venture to remain or ſleep " one night on ſhore, during the rainy ſeaſon,

" without running the hazard of his life, or,
" at leaſt, of a dangerous fit of ſickneſs; and
" at Podang, a Dutch ſettlement on Sumatra,
" the air has been found ſo bad that it is com-
" monly called the Plague coaſt; here a thick,
" peſtilential vapour ariſes *after the rains, from*
" *the marſhes, which deſtroys all the white inha-*
" *bitants.*" (Lind, on Hot Climates, p. 84.)

" The climate next to Bencoolen moſt fatal
" to Europeans, is Bengal. The rainy ſeaſon
" commences in June and continues till Octo-
" ber. The remainder of the year is healthy
" and pleaſant. During the rains, this rich
" and fertile country is almoſt covered with the
" river Ganges, and converted, as it were, into
" a large pool of water. Diſeaſes rage among
" the Europeans in the months of July, Auguſt,
" September, and October, attacking chiefly
" ſuch as are lately arrived. Here, as in all
" other places, ſickneſs is more fatal and fre-
" quent in ſome years than in others. The
" diſtempers are fevers of the remitting and
" intermitting kind." (P. 88, ibid.)

"Beſides malignant and remitting fevers, which
" rage during the *wet ſeaſon*, and for ſome time
" after it, in the moſt unhealthy parts of India,
" Europeans, ſuch as live intemperately, are
" are alſo ſubject to fluxes, and to an inflamma-
" tion or diſeaſe of the liver, which laſt is
" almoſt

" almoſt peculiar to India, and particularly to " the Coromandel coaſt." (P. 100, Ibid.)

" The diſeaſes moſt fatal at Calcutta, while I " was there, in 1757, began with the *rainy* " *ſeaſon*, and were obſtinate putrid intermit- " ting fevers, (P. 102. ibid.)

" Balambangan is a ſmall iſland of about 45 " miles in circumference, which is to the weſt- " ward of Borneo, and is covered with *ſand* " *and ſwamps*. The ſeaſons of health and ſick- " neſs are here regulated by the direction of the " wind or monſoon. From October till April, " during the north-eaſt monſoon, the wind " comes from the ſea, and the ſettlement is per- " fectly healthy; but from April till October, " during the ſouth-weſt monſoon, the wind " blows over the *marſhes*, both of this and the " iſland Borneo, and produces fevers of the " moſt malignant nature, which frequently cut " off the ſtouteſt men in twelve or fourteen " hours." (P. 108, ibid.)

" In the vaſt plains of South America, a " burning ſun operating on the extenſive ſwamps, " and the inundations that ſucceed the rainy " ſeaſon, ſometimes generates dreadful epide- " micks. The miſſionaries ſpeak of contagious " diſtempers as frequent among the Indians, and " occaſioning, at times, a great mortality in their " villages. The ſmall-pox every where makes " great ravages, as, from want of care, and

" from confined habitations, very few that are " attacked recover from it. The Indians of " Paraguay are ſaid to be extremely ſubject to " contagious diſtempers, notwithſtanding the " care and attentions of the Jeſuits. The ſmall- " pox and malignant fevers, which, from the " ravages they make, are called plagues, fre- " quently deſolate theſe flouriſhing miſſions, " and, according to Ulloa, are the cauſe that " they had not increaſed in proportion to the " time of their eſtabliſhment, and the profound " peace which they had enjoyed." Mr. Malthus, on Population, p. 31.

The univerſal conſequence, that fever follows the expoſure to paludal gas, thus appears to be one of the moſt authentic and beſt eſtabliſhed facts in medical ſcience. From identity of effect in inducing febrile actions, the concluſion is moſt legitimate, that a peculiar vapour, philoſophically nominated a gas, poſſeſſing individual properties, iſſues from all the ſources deſcribed by the authors juſt cited. In the courſe of our inquiry*, we ſhall probably diſcover, that a peculiar febrilizing gas is alſo generated in living animal bodies, under certain circumſtances, the ſimple pyrexial effects of which are nearly ſimilar to thoſe of the paludous, with the addition of contagious properties hereafter to be defined.

* Poſition 3d.

The

The concluſions relative to each of theſe gaſes, are contained in the ſecond poſition about to be ſtated; and that their names may correſpond with their origin and peculiar effects, it ſeems not unſuitable to denominate the one paludous or limoſe*, the other contagious, gas; the term, pyrexial, may be common to both.

2dly. *The effluvia from febrile animal bodies, and the exhalations from marſhes, ſwamps, and mud, are gaſes of a peculiar compoſition, of which hydrogen, or the principle of humidity, forms an eſſential conſtituent part.* They do not appear to be the mere reſult of animal or vegetable putrefaction, although putreſcent matter is moſt generally preſent, as requiſite to their formation.

Contagious pyrexial gas is not yet proved to be the reſult of ſimple deoxygenated human effluvia, unaided by, or uncompounded with, either febrile, or paludous, or limoſe gas.

Although the preciſe compoſition of pyrexial gaſes, whether contagious, limoſe, or paludous, has not been diſcovered, yet, from a great number of facts, it is evident, that an aqueous conſtituent is eſſential to the compoſition of both. In the citations already extracted, to prove the effect of marſh miaſmata, it has been amply demonſtrated, that dampneſs, moiſture, or humidity, is always an indiſpenſable ingredient in the

* From limus, mud, mire, &c., limoſus, muddy, miry.

exhalations which induce fever. In the following paſſages, the ſame truth is fully maintained. But another very important truth is alſo now, I believe, for the firſt time, brought to light, that, by depriving the pyrexial gaſes of their aqueous or hydrogenous principle, THEY ARE, FOR THE TIME, ANNIHILATED. THAT, UPON THIS SOLE PRINCIPLE, WE ARE ENABLED TO ACCOUNT FOR THE WELL-KNOWN FACT, THAT EXTREME ADDITIONS OR ABSTRACTIONS OF CALORIC OR HEAT, ARREST THE PROGRESS, OR DESTROY THE EXISTENCE OF ALL EPIDEMIC AND CONTAGIOUS DISEASES.

It will, in the next place, be requiſite to adduce the evidence by which theſe circumſtances, equal in magnitude and ſimplicity, are ſubſtantiated. The following extracts, proving the effect of humidity, are ſelected from among many others, to be found in Sir J. Pringle's army diſeaſes. A more complete teſtimony in favour of the point to be here eſtabliſhed, need not be adduced. "Ghent is ſituated between "the high and low diviſion of Flanders, one "part of the town, called St. Peter's hill, is "much higher than the reſt, and in this the "barracks, having drains and free air, were "quite *dry*; ſo that the ſoldiers who lay there "enjoyed perfect health. But thoſe who were "quartered in the lower parts of the town, "moſtly in the ground floors of waſte houſes

" unprovided with drains, and of courſe *damp*,
" were ſickly. The battalion of the firſt regi-
" ment of guards was an inſtance of the effect
" of this difference of quarters. Two of the
" companies lay on St. Peter's hill, the remain-
" ing eight, in the lower parts of the town, in
" rooms ſo very *damp*, that the men could
" ſcarce keep their belts and ſhoes from mould-
" ing. In the month of July, the ſick of this
" battalion amounted to about one hundred and
" forty, of which number, only two men be-
" longed to the garriſon on the hill, and the
" reſt to thoſe of the lower town." (P. 12, Garriſon Diſeaſes.)

" The plague diſcovers itſelf generally in
" certain ſeaſons; *ſoutherly winds*, a *warm* and
" *humid air*, are favourable to it's production,
" or, perhaps, rather to it's development.
" Northerly winds, and the extremes of heat
" and cold, alike produce a ceſſation of the
" malady; a corpſe does not appear to tranſ-
" mit it, and bodies poſſeſſing a febrile heat
" ſeem to communicate the infection with moſt
" facility; removal limits the contagion." Extract from Deſgenette's Medical Hiſt. of the Army of the Eaſt. Monthly Magazine, p. 631. Retroſpect, Jan. 1, 1803.

The plague has been obſerved to ſpread more rapidly in *damp* and *foggy*, than in clear dry weather.

Dr. Lind obſerves of typhus, that a damp air ſeems to increaſe the ſtrength of it's contagion; Dr. Smith makes a ſimilar obſervation, Ibid. p. 417. "At Aboukir, the dead bodies of the "Turks, French, and Engliſh, might have oc- "caſioned the putrid miaſmata, containing the "ſources of the diſeaſe; and in favour of the "hypotheſis, medical men ſhould know, that at "Aboukir the plague continued longer than in "any other part of Egypt. The ſun there, on "account of the ſea-breezes, did not poſſeſs "ſufficient power to abſorb all mephitic exha- "lations." Sir Robert Wilſon, p. 243. We have here a very convincing proof of the neceſſity of the preſence of *moiſture*, in rendering the moſt putrid exhalations pernicious to the human frame, and alſo receive a full confirmation collaterally, that the moſt powerful, concentrated, febrilizing gas may be, and is, decompoſed or diſſipated by *heat*. As it may be ſafely concluded, that paludous miaſmata are never morbific, except in the form of gas, ſo it is equally probable, that the effluvia from the human body, labouring under contagious fever, retain a ſimilar form during their effective ſtate; becauſe, like the former, they alſo become inert, or ceaſe to exiſt in thoſe extremes of heat or cold, which deprive them of the hydrogenous principle. It is a well known fact, that the infected

fected clothes of the perſons dead of the plague, in the Levant, are expoſed to ſale with impunity in the public markets, at the period when, in that burning climate, the exceſſive heat of the ſun has alike deſtroyed the pyrexial gaſes, which iſſued from the marſhes, and the contagious effluvia ariſing from the living infected inhabitants of that country.

From this ſtriking fact we ſhall be enabled to ſolve the problem propoſed by that enlightened author, Sir Robert Wilſon. "The problem (ſays "he) is more arduous, that if the plague be "contagious, and, not like the ſmall pox, to be "had only once in a life, how, in a country "where no care is taken to check the exten-"ſion, population has not long ſince become "extinct?" The heat of the climate entirely extinguiſhes the gaſes which iſſue from the human body equally with that from fomites and from marſhes, mud, ſlime, &c. ſo that every ſource of the plague is thus annually extinguiſhed, and the population preſerved by the ſame power which inflicts the calamity.

The ſame author teſtifies to this truth in theſe words: "The plague (ſays he) commences in "Egypt when the Nile begins to fall, and "*ceaſes to be fatal* (almoſt to a day; many pre-"tend preciſely ſo) after the 17th of June, "which is the period of the ſummer ſolſtice, "and

" and when the Nile is ſuppoſed to receive the " firſt increaſe*.

" As the waters of the Nile retire from the " ſurface of the country they had inundated, a " rich ſlime of conſiderable condenſity is left, " which forms a ſoil ſo productive, as to render " Egypt the moſt fertile land in the whole " world: but, unfortunately, the benefits of na- " ture are always charged with a proportion of " evil. This ſlime, ſubjected to the univerſal " laws, is no ſooner ſeparated from it's principle

* Mr. Bruce, Dr. Ruſſel, and ſeveral others, ſubſtantiate the ſame occurrence. But if the plague could be kept up by mere contact of the morbid cuticle, or of the matter of buboes, this certain periodical decline and ultimate ceſſation of that dreadful peſt could never take place. For a number of perſons muſt be in various ſtates of glandular and cutaneous diſeaſe, of danger, of recovery, and convaleſcence, and conſequently capable of yielding infection, when this happy change in the temperature of the atmoſphere commences. The rapidity with which evaporation and decompoſition are effected, under great acceſſions of caloric, will account for the ſudden ceſſation of the peſtilence, which could not, by any other means, be effected; nor could be ſo completely accounted for as by confining the infectious influence to the operation of effluvia, which are thus ſuddenly and eaſily diſſipated. Comparing the facts which prove, that hydrogen, or the principle of humidity, is eſſential to the exiſtence of theſe pyrexial gaſes, with the effects of heat and cold upon them, the abſtraction of water will clearly appear to be the ſole cauſe of their ceaſing to act.

of

" of action, than corruption enſues, and con-
" tinues until all the putrid juices are abſorbed
" by the heat of the ſun, which then leaves
" the ground perfectly brittle, with the fiſſures
" previouſly deſcribed. The atmoſphere at this
" time ceaſing to be tainted, the plague
" throughout Egypt diſappears." Sir R. W. p. 242.

" The natural cauſe of the plague ceaſing at
" that time (between the 17th and 24th of
" June) is the great heat; Fahrenheit's thermo-
" meter at that time ſtanding generally at 90 or
" 92° in the ſhade; and that this muſt be the
" cauſe will appear by the following fact: In
" the year 1781, the plague broke out about
" the middle of April, and increaſed with ſuch
" rapidity and virulence, that ſometimes one
" thouſand people died of it in one day at
" Cairo; but, about the middle of May, the
" wind ſhifted to the Eaſt, which occaſioned a
" few days violent heat; in conſequence of
" which, it immediately diminiſhed; and though,
" as the weather became again cooler, the
" plague did not leave the country before the
" end of June, yet it never increaſed to the
" ſame degree as before, but continued dwind-
" ling away till it ceaſed entirely, when the
" ſummer heat became regular. It has always
" been obſerved in Egypt, that a great degree
" of heat, if even but for a few days, has this
" effect;

" effect; but this time it was very remarkable. " It has ſeveral times fallen under my own im- " mediate obſervation, that veſſels came to Alex- " andria from the other parts of Turkey with many " people on board, affected by the plague after " that period, but the infection never took." Obſervations on Egypt, p. 44. Antis. "Conſtanti- " nople ſeems to be ſeldom or ever quite free " from it; nor do the inhabitants of Conſtanti- " nople, Smyrna, and other parts of Turkey, " know ſo certainly when it will ceaſe, as thoſe " of Egypt: moſt probably the reaſon is, be- " cauſe the degree of heat is never ſo great " there for any continuance, nor ſo regular. " At thoſe places particularly, the intenſe cold " ſeems more effectually to diminiſh it's fury; " but it does not eradicate it with ſo much cer- " tainty as the heat will do it at Grand Cairo." Ib. p. 45.

No facts can be more to the purpoſe than theſe laſt quoted from an author of great fidelity, who knew neither the cauſe of the plague's origin, nor of it's termination. It appears from his account, that neither the cold nor heat is ſufficiently intenſe to deſtroy the plague entirely at Conſtantinople, in ſome ſeaſons at leaſt.

As exceſſive additions of caloric deſtroy the ſources of pyrexial gaſes, and decompoſe the gaſes themſelves, by diſſipating or attracting from them the humid or hydrogenous principle

in

in their compoſition, ſo does the extreme abſtraction of heat annihilate their gaſeous form, to the exiſtence of which certain portions of caloric, as well as water, are eſſential.

A few well authenticated facts will be ſufficient to eſtabliſh this poſition. The ſubſequent one proves both the effects of moiſture and of froſt.

" The ſickneſs was more conſiderable at " Bruges, a city of the lower diviſion of Flan- " ders, and *moiſter* than Ghent; the ſoldiers " had likewiſe *damper* barracks. The remitting " and intermitting fevers began in July. In " Auguſt the intermittents were moſt numerous, " which they continued to be throughout Sep- " tember, but diminiſhed in October, and *ceaſed* " *upon the ſetting in of the froſts in November.*" P. 13. Garriſon Diſeaſes. Flanders.

" The peſtilence of 1793, of Philadelphia, " began in the beginning of Auguſt, and it was " not till the coming of the froſt that the diſ- " eaſe ſubſided, after having proved fatal to " near 5000 perſons." Dr. Haygarth's Appendix, p. 168. " A black froſt in the night " of October the 26th gave a ſenſible check to " the progreſs of the diſeaſe, after which it ra- " pidly declined, and entirely ceaſed before the " middle of November." (Dr. W. Currie's Account of Yellow Fever. Med. Journal for Feb. 1803). Dr. Johnſtone, of Kidderminſter, in his

Hiſtory of the Malignant Epidemic Fever of 1756, makes the following remarks. "From "the beginning of November to Chriſtmas the "weather was very foggy, cloudy, hazy, rainy, "and without froſt; our malignant fever "(which had been checked in it's progreſs and "frequency by the dry and froſty weather in "October) appeared again with renewed force, "and continued throughout the remainder of "the year. But the long continued froſts, "which began with the preſent year, gave an "effectual check to it's progreſs," &c. p. 17. The following very curious facts appear to prove, that when the quantity of heat, which ſupports the living functions, has quitted the human body with it's life, no infectious effluvia emanate from it. This concluſion is not only ſupported by the foregoing facts, which prove, that the effluvia muſt be in a gaſeous ſtate; but alſo that this is the reaſon why peſtiferous carcaſes may be, and are, handled with impunity; and not becauſe the plague itſelf is not contagious or infectious, as Mr. Aſſalini wiſhes us to believe, when he relates the following account. He amputated a man's thigh, who had loſt his leg by a bullet. The day after the operation, the patient was in a good way, though he was placed between two unfortunate creatures, who had died the ſame night with buboes. This patient, after the taking of Jaffa,

was

was carried to the hoſpital, where he recovered. Note, p. 22.

Mr. Deſgenette, Dr. Wittman, Mr. Howard, and, I believe, Ruſſel, all mention the circumſtance, that bodies dead from plague are not contagious. A very ſatisfactory confirmation of the doctrine, that pyrexial gaſes ariſe from mud in any ſituation, as well as that of marſhes, that they are pyrexial gaſes chemically conſtituted, and that they cannot exiſt under certain abſtractions of caloric and water, is exhibited in the experiments of Dr. Whyte and Dr. Seybert. Theſe experiments were totally unknown to me previouſly to the concluſions which I had formed from the foregoing facts now quoted, from which they were drawn. I ſhall preſent my readers with ſuch extracts from theſe experiments as are relevant to our ſubject.

" I am of opinion (ſays Dr. Seybert), that the " hydrogen gas is afforded by the decompoſition " of the ſtagnant water, effected by the putre- " faction of the dead animal and vegetable " ſubſtances, which enter largely into the com- " poſition of the ſoil of marſhes. I was induced " to form this opinion, becauſe, firſt, pure water " is a compound of but two elements, conſe- " quently, the affinity cannot be broken but by " the action of a third ſubſtance; and, ſe- " condly, we have no experiments to prove, " that pure water has undergone ſpontaneous " decompoſition.

" decompoſition. My ideas are confirmed by a " fact known to all ſeamen, viz. when a candle " is applied to the bung hole of a caſk contain- " ing river water, which had been for ſome time " cloſely ſtopped, an elaſtic fluid eſcapes which " will inflame, and appears in all reſpects ſimi- " lar to hydrogen gas obtained by other " means.

" After forming the above conjectures, I de- " termined to perform a few experiments, " which might tend to confirm or diſprove my " opinion. With this view, mud and water, with " a very ſmall portion of atmoſpheric air, were " at different times cloſely confined in bottles, " cloſely ſtopped, and inverted over water. In " ſome inſtances, the experiment was continued " during twenty and thirty days. They were " ſubjected to the temperature of the atmoſphere. " During the progreſs of the experiments, I " perceived, that an elaſtic fluid was diſen- " gaged from the materials contained in the " bottles, and that the water was evidently di- " miniſhed in bulk. The elaſtic fluid gene- " rated during theſe experiments; 1ſt, inſtantly " formed a copious white precipitate when agi- " tated with lime water; ſecondly, it burned " when the flame of a candle was applied to it, " and poſſeſſed the other properties which are " common to air obtained by agitating ſtagnant " waters over marſhes.

" The

" The above experiments teach us, that mud " vitiates the atmoſphere in a very powerful " manner. They alſo enable us to account for " the preſence of the elaſtic fluid forming the " atmoſphere of marſhes. It appears, that the " carbone of the mud unites with the oxygen " of the decompoſed water, and forms the " carbonic acid gas, whilſt the hydrogen gas is " ſet at liberty. Theſe are truths not to be in- " validated by gratuitous aſſertions, ſince their " baſis is experiment.

" That the atmoſphere of marſhes, therefore, " differs in certain circumſtances from that of " other ſituations, and that the ſoil has conſi- " derable effect in altering the air of the at- " moſphere, I think cannot be doubted. Let " us, therefore, endeavour to diſcover the par- " ticular local cauſes, which give riſe to theſe " variations.

" I have before hinted, that the putrefaction " of animal and vegetable matters upon the ſoil " of marſhes was the great cauſe of the changes " obſerved to exiſt; for every ſpecies of ſoil " will not operate in the manner alluded to.

" That the cauſe is in the putrefaction of " theſe matters, and that this ſtate is abſolutely " neceſſary to thoſe changes, I infer from the " following circumſtance: marſhes have no " noxious influence during the winter ſeaſon. " They cauſe diſeaſe when the circumſtances

" are preſent, which promote putrefaction; as a " proper degree of heat, a due quantity of " moiſture, and the contact of atmoſpheric air " or ſubſtances capable of affording oxygen, as " *water*. That a certain degree of *moiſture* is " neceſſary appears evident from White's ex- " periments, related in the Philoſophical Tranſ- " actions. He ſays, 'a certain degree of *moiſ-* " *ture* ſeems neceſſary to produce the bad ef- " fects of *marſhes*; for mud, when perfectly " dry, did not alter the air.' He might have " added, that too much fluidity will likewiſe pre- " vent their bad conſequences, which is proved " by the neighbourhood being healthy when " overflowed. An overflow of water may operate " by preventing the powerful effects of the ſun. " Experience teaches us, that their bad effects " are diſcontinued when they become dry. Co- " vering them with clay, and other ſubſtances " not liable to putrefaction, deſtroys their bad " effects, and ſo does cultivation, froſt, &c.

" Living trees, being planted in their neigh- " bourhood, renders the ſituation more healthy " by abſorbing the gas exhaled during putre- " faction, and affording oxygen gas.

" White's experiments prove, '1ſt, During " ſixteen hours, air confined in a phial over " water did not ſuffer a change. 2dly, Pure " clay, moiſtened, did not alter the purity of the " air. 3dly, Sand, moiſtened, did not alter the

" purity

" purity of the air. But, 4th, *mud (which con-*
" *ſiſts of earths intimately mixed with dead animal*
" *and vegetable ſubſtances) rendered the air very*
" *impure, as I proved by the experiments which I*
" *performed.*"

I do not deny, that putreſcent matter is moſt commonly acceſſary to the formation of pyrexial gas; but I alſo am convinced, that too much ſtreſs has been laid univerſally on the pyrexial effects of putridity, while a more eſſential acceſſory *moiſture* has not been equally adverted to. Since carbon is known to attract oxygen from water, and releaſe the hydrogen it contains, may not pyrexial gas be formed where putreſcent materials are not preſent? On the contrary, the moſt putreſcent effluvia are known to prevail where no fever is generated. After preſenting my readers with the following facts, which ſo ſtrongly favour my poſition, I ſhall beg leave to add the motive which urges me to dwell upon the ſuppoſed effects of mere putrefaction as a cauſe of fever. I conceive, that ſources of pyrexial gas might have been preſent without being ſuſpected, where cauſes of putridity either could not be traced, or were not ſuppoſed to exiſt. Hence, the cauſes and origin of ſome epidemics remaining unknown, their effects could not be counteracted. The facts are as follow:

" If it were aſked, what was the cauſe of jail
" fever? Mr. Howard obſerves, it would in ge-

" neral be replied, want of freſh air and clean-
" lineſs. But as I have found, in ſome priſons
" abroad, cells and dungeons as offenſive and
" dirty as any in this country, where, however,
" *this diſtemper* is unknown, I am obliged
" to look out for ſome additional cauſe of
" it's production." P. 231. Howard on Priſons.

Humidity is probably the additional cauſe of which this revered author was in queſt. We are hence enabled to account for the curious circumſtance he thus relates:

" At Moſcow, the ancient capital of Ruſſia,
" I found no traces of any ſuch priſons or dun-
" geons as were common in the caſtles of Eng-
" land, and in ſeveral foreign countries. This
" cruel mode of confinement in many of our
" priſons has been, and ſtill is, a principal cauſe
" of jail fever; no ſymptoms of which did I ſee
" in Peterſburg, Moſcow, or any part of Ruſſia."
P. 230, Note. Ib.

This exemption, moſt likely, is aſcribable to the *dryneſs* of their priſons, which, in addition to their being raiſed above the ground, are kept dry by the ſtoves, which are in univerſal uſe in that country. See Mr. Howard's Deſcription and Plate of the Priſon, at Moſcow, page 231, on Priſons.

" The governor of the French hoſpital, at
" Smyrna, told me (ſays the ſame author), that
" in

" in the laſt dreadful plague there, his houſe " was rendered almoſt inſupportable by an of- " fenſive ſcent, eſpecially if he opened any of " thoſe windows, which looked towards the " great burying ground, where numbers were " left every day unburied; but it had no effect " on the health of himſelf or his family. An " opulent merchant in the city told me, that " he and his family had felt the ſame incon- " venience without any bad conſequence." Howard on Lazarettoes. Note, P. 25, Sect. 2d.

Mr. Didier aſſerts, " that two monaſteries " (from their ſituation, the one near a burial " ground, the other near a peſt houſe) very " dangerouſly ſituated, remained nevertheleſs " untouched," &c. Traité de la Peſte, p. 355. Ruſſel, p. 248. Mr. Didier, in his time, ſtrongly argued againſt the contagious nature of the plague, and gives the above as an inſtance, that the air was not infectious, though it muſt have been highly ſcented with putrid odours.

Mr. Currie, who has written an ingenious paper in Med. Journal, No. xxxiv, p. 499, on the inſalubrity of marſhy ſituations, and who imputes the diſeaſes ariſing thence, not to the influence of *miaſmata*, but to the ſimple abſtraction of oxygen from marſhy atmoſpheres, produces this paragraph in confirmation of what I am advancing, with reſpect to putrid miaſms, or effluvia.

" Noxious effluvia, indeed, frequently arife " from putrid animal fubftances in confined " fituations. Dr. Monro mentions a remark- " able inftance of this, and fome later examples " are recorded by Mr. St. John; but it does " not appear from thefe cafes, that thofe noxious " effluvia produced any fymptoms refembling " thofe of putrid or peftilential fevers; on the " contrary, they acted as direct ftimulants, and " occafioned inflammatory affections without " being preceded by that fenfe of debility, which " always precedes thofe fevers that are occa- " fioned by febrile contagion."

A ftronger inftance of the innoxious influence of a highly putrefcent ftate of the atmofphere in a hot climate, than the following, can hardly be produced. It is advanced by Mr. Percival, of the 19th Regiment, in his excellent account of the Ifland of Ceylon. This gentleman being a very accurate obferver, even of medical phenomena, and having noted the caufes of difeafe on other occafions, would not have failed to remark and to publifh the fort of difeafes, if any had occurred, under the circumftances which he thus relates:

" As foon as the oyfters are taken out of the " boats, they are carried by the different people " to whom they belong, and placed in holes or " pits dug in the ground, about two feet deep, " or in fmall fquare places, cleared and fenced

" round

" round for the purpoſe; each perſon having " his own ſeparate diviſion. Mats are ſpread " below to prevent the oyſters from touching " the earth; and here they are left to die and " rot. As ſoon as they have paſſed through a " ſtate of putrefaction, and have become dry, " they are eaſily opened without any danger of " injuring the pearls, which might be the caſe " if they were opened freſh, as at that time to " do ſo requires great force. The ſtench occa- " ſioned by the oyſters being left to putrefy, is " intolerable, and remains for a long while after " the fiſhery is over. It corrupts the atmoſphere " for ſeveral miles round Condatchy, and ren- " ders the neighbourhood of that country ex- " tremely unpleaſant, till the monſoons and vio- " lent ſouth weſt winds ſet in, and purify the " air. The nauſeous ſmell, however, is not " able to overcome the hopes of gain; for " months after the fiſhing ſeaſon, numbers of " people are to be ſeen earneſtly poring over the " ſands, and places where the oyſters had been " laid to putrefy." Percival's Account of Cey- " lon, p. 71.

The following remark is very much in point:

" Several writers ſuppoſe the plague proceeds " from the Canal, or Calige, which paſſes " through Grand Cairo. It is very true, that " the remaining water is horribly corrupted by " the filth thrown in from the adjoining houſes,

" and the great number of neceſſaries that " empty themſelves into it, which occaſions a " moſt abominable ſtench for ſeveral months in " the year, &c. All the houſes of the mer- " chants in Grand Cairo have, for more than " two hundred years, been ſituated cloſe to this " Canal, or very near it; and neither have " theſe, nor any of the other inhabitants, who " live in the ſame ſituation, been more affected " with diſeaſes than the reſt. Nor has any of " thoſe merchants, who have performed a ſtrict " quarantine, been ever affected with the " plague." Antes's Obſervations on Egypt, p. 38, 39.

" But though ſuch a circumſtance would " certainly prove very pernicious in our coun- " tries, yet it ſeems not to be ſo here; and I do " not know to what to aſcribe it, *but to the ex-* " *ceſſive dry air of Egypt,* eſpecially at that ſea- " ſon." Ib. ib.

There are no facts with which I am acquainted, that prove accumulated human effluvia, from healthy bodies, uncompounded with limoſe or paludous gas, to be capable of generating fever. On the contrary, the following abridged account ſtrongly militates againſt ſuch an occurrence.

A number of poor children, male and female, were removed in September, 1782, from Wimbledon to a large houſe in King ſtreet, Golden ſquare. They continued in good health till

the 8th of October. From this time a number of girls were ſeized in ſucceſſion, at different intervals, with ſickneſs, vomiting, ſometimes purging, excruciating pain in the region of the ſtomach and in the back, which was ſoon followed by violent head-ach, delirium, and convulſions; they were in general coſtive. The ſymptoms were relieved by purgatives, but returned again each time with more violence.

" During the remiſſion of the diſeaſe, they " uſed to lie quiet during an hour, or even two " hours, then ſuddenly to ſtart up as before, " ſcreaming under the moſt afflictive torture, " &c. They all agreed, that, the fit ap- " proaching, their firſt ſenſation of pain was in " the ſtomach; which having abated, the head, " particularly the back part of it, was attacked " in like manner; and it appeared, that a total " perverſion of the underſtanding very ſoon fol- " lowed. *None of them had any degree of fever*, " &c. It was obſervable, that their paroxyſms " were always moſt ſevere after ſleep. The " diſeaſe was ſhown only on certain of the girls, " who ſlept in a particular apartment. It con- " tained ten beds, in which it was intended, " that eighteen girls, two in a bed, and a " female ſervant, ſingly, ſhould ſleep; but being " a favourite room, on account of it's warmth, " it was generally crowded at night by a much " greater

" greater number than it's juſt complement. " That as much ſpace as poſſible might be made " for beds, the chimney had been ſtopped up " with bricks, and it had been the cuſtom of " the ſervant at night to keep the door ſhut, " and to cloſe the window ſhutters, that as little " freſh air as poſſible might have acceſs. - - - - " From the time of the commencement of the " illneſs, three candles and a lamp of oil had " been uſed during the night; but they were " hardly of any ſervice, giving a glimmering " light, and frequently almoſt extinguiſhed."

From the following ſtatement it evidently appears, that the origin and cauſe of this diſeaſe conſiſted in an accumulation of human effluvia, uncombined with any other morbific gas, particularly pyrexial. For Sir George proceeds:

" It was likewiſe remarkable, that in a cham- " ber adjoining, of the ſame dimenſions, painted " at the ſame time, in which eighteen girls " ſlept in nine beds, (which chamber differed " from the other only in having an open chim- " ney, and not being ſo cloſely ſhut up during " the night,) none of the children had a ſymp- " tom of the diſeaſe. Another ſtriking fact " was, that a female ſervant, who had paſſed " one night only in attendance on the chil- " dren in the chamber of the ſick, was on the

" following

" following morning attacked by the ſame pain, " delirium, convulſions, &c." Medical Tranſact. vol. iii, p. 113.

3dly. *The greateſt number, if not all acute contagions, originate, in the firſt inſtance, from the exhalations or gaſes above ſpecified: but they aſſume the property of propagating diſeaſes ſimilar to themſelves, only under peculiar circumſtances, which occaſion their converſion from ſimple into contagious fever. The cauſe of this converſion is the expoſure to accumulated* FEBRILIZED *animal effluvia.*

The converſion of ſimple into contagious fevers is a fact eſtabliſhed on the moſt ſatisfactory and undoubted teſtimony, part of which I ſhall now preſent to my reader. The ſame facts, which aſcertain the above mentioned converſion, alſo demonſtrate the cauſe to be that which I have juſt ſtated.

Dr. Lind gives the following accounts of the tranſition from ſimple epidemic fevers to contagious ones.

" In the year 1741, no ſooner had the rainy " ſeaſon ſet in at Carthagena, where the En- " gliſh troops lay encamped, than the ſame diſ- " eaſes, then remarkably malignant, became " alſo *contagious*, and deſtroyed the greateſt " part of the army, the poor remains of which " were afterwards almoſt cut off in the ſickly " ſeaſon

" ſeaſon in the iſland of Cuba." Page 138. Lind on Hot Climates.

" The Merlin ſloop continued in the river " Gambia ſix days, wooding and watering; " while there, all the men were in perfect " health, but in about two days after they put " to ſea, thoſe who had been employed in wood- " ing were ſucceſſively taken ill; afterwards, " thoſe who had been employed in the duty of " watering were ſeized in the ſame manner. " Theſe men *alone* were at firſt ſeized with the " fever, and ſeveral of them in a day continued " to fall ſick, for ſix or ſeven days afterwards: " until, at length, almoſt all that had been em- " ployed on thoſe ſervices were ill. After them, " their attendants were ſeized with the fever, " and in ſuch numbers as to leave no doubt of " the diſeaſe being infectious. Ibid, p. 196.

" The remittent fever, contracted at un- " healthy harbours where ſhips touch for re- " freſhment, as well as at thoſe where they un- " load and take in their cargoes, from inatten- " tion to cleanlineſs and ventilation, acquires a " high degree of virulence and *contagion.*" Clark's Collection, p. 61.

Inſtances of agues becoming infectious are recorded by the ſame author in another work.

Though Mr. Aſſalini has not ſucceeded in proving the plague not to be contagious or in-

fectious,

fectious, yet he has fully eſtabliſhed the important fact, that it is ſimply epidemic in it's origin, as evidently appears in the following tranſcript from his work, entitled, Obſervations ſur la Maladie appelée Peſte, from p. 21 to 28, which is quoted at large, becauſe his work is not tranſlated, or in general circulation.

" This diſeaſe appeared at Alexandria and " Damietta, in the year vii of the French Re- " public, in the months Brumaire and Vende- " miaire, among the troops then at Roſetta, and " two months afterward in the army of Syria. " On the 19th of Ventoſe, I ſaw, for the firſt time, " under the walls of Jaffa, about twenty ſoldiers " ſuffering under this diſeaſe, who, not being " able to ſtand, were laid round my tent, &c. " Upon the ſuppoſition of contagion, the queſ- " tion is ſtill unſolved, whether the diſeaſe was " conveyed into Syria by the ſoldiers coming from " Damietta, or whether it was the Turkiſh pri- " ſoners taken at Jaffa and El Ariſh, who com- " municated it to the French army.

" It is not fully proved, that the ſoldiers of " *Djezzar*, at El Ariſh and at Jaffa, were affected " with the diſeaſe; I ſaw, cloſe to our camp, " about 4000 of theſe priſoners, collected toge- " ther like a flock of ſheep, and kept under " ſtrict guard during three days and nights, not " one of whom was taken ill. If the malady " had exiſted among theſe people, it would have

" undoubt-

" undoubtedly appeared upon ſome of them,
" which, however, did not happen.

" This fact, known through the whole army,
" ſufficiently proves, that neither the plague, nor
" any other ſickneſs, infeſted the troops of the
" pacha of Acre, which were the ſame Turkiſh
" troops that were at El Ariſh. The Mogra-
" bians, who defended this fort, and who, being
" a corp of auxiliaries, formed the rear guard of
" our army, all enjoyed perfect health.

" Let us now ſee if the troops of Kleber's
" diviſion coming from Damietta could have
" conveyed the ſickneſs to the army, which pro-
" ceeded directly from Cairo. It is certain that
" Kleber's diviſion, after it's departure from Da-
" mietta, no longer contained any invalids; and
" on the arrival of the army of Egypt in Syria,
" it marched to Jaffa, then towards the river
" Jordan, without communicating with the
" Troops which came from Cairo.

" If the army which marched from Egypt
" were attacked on it's arrival in Syria with an
" epidemic ſickneſs, which, in the ſequel, was
" termed the plague, this ought not to be attri-
" buted to contagion, but to the fatigues en-
" countered in traverſing the deſerts that ſepa-
" rate Egypt from Syria.

" To give a juſt idea of this, it will not be
" unuſeful to deſcribe the particulars of the
" route. The army deſtined to march into Syria

" ſet

" ſet out from Cairo towards the middle of the
" month Pluvioſe, in the year vii; and though it
" was winter, the days were very hot, and the
" nights clear and temperate. The army, which
" enjoyed perfect health, croſſed the deſert with
" heroic courage; ſome days after, having en-
" tirely conſumed the water which was conveyed
" in it's ſuite, it was often conſtrained, by ne-
" ceſſity, to drink brackiſh or muddy ſtagnant
" water, which increaſed inſtead of leſſening
" the deſire to drink. The failure of proviſion
" was added to this privation, and having no
" other reſource, the horſes and camels, which
" had become uſeleſs to the army, were killed
" for the ſake of their fleſh, which was obliged
" to be eaten without bread. After a march of
" twenty-one days, the army arrived in Syria, and
" encamped on the 5th of Ventoſe, near Saza;
" on the 11th, near Ramla; on the 13th, under
" the walls of Jaffa. The ſoil of Syria pre-
" ſented neither the arid plains, nor the burning
" ſands of the deſert through which it had paſſed:
" at this period, the weſterly winds prevailed;
" they were loaded with vapours from the ſea,
" and theſe vapours, being condenſed by a cooler
" temperature, produced very abundant rains,
" accompanied with terrible hurricanes. Theſe
" rains rendered the roads more fatiguing; the
" low lands were overflowed, as well as the rivu-
" lets, which the troops were often obliged to

" ford

" ford up to their middle in water. How often
" were our ſoldiers drenched with rain, both by
" day and night? All had ſlept upon the damp
" ſoil of Ramla; all had breathed the thick
" vapours of it's environs, covered with an im-
" menſe number of olive trees; but all had not
" the ſame opportunity of drying their clothes,
" or of favouring perſpiration by a proper co-
" vering during the night; nor could all pro-
" cure a ſmall portion of brandy for their re-
" freſhment. Having arrived at Jaffa, the di-
" viſion Bon was encamped to the right of that
" town; the diviſion Lannes to the left. The
" head quarters and the park of artillery occu-
" pied a riſing ground to the ſouth of the town.
" The diviſion Bon was placed near the ſea, pre-
" ciſely upon the *borders of a lake of ſtagnant*
" *water*; and the direction of the wind was ſuch
" as to convey the *paludal exhalations* into the
" camp of that diviſion. The ſickneſs made it's
" firſt appearance among theſe troops, though
" they came immediately from Cairo. Citizen
" St. Ourſe, ſurgeon of the firſt claſs, made a
" circumſtantial report to the Officers of Health
" in Chief of the Army, appriſing them, that
" the diviſion Bon, and particularly the 32d
" demibrigade were affected with a ſuſpicious
" diſtemper, accompanied with buboes. The
" other diviſions were not exempt from the ſame.
" It is acknowledged, that the atmoſphere of
" Jaffa,

" Jaffa, and the whole coaſt of Syria is *moiſt* " and heavy, that it is tainted with *paludal ex-* " *halations*, and that the action of the ſun upon " theſe thick vapours renders them noxious. " Our ſoldiers, after remaining eight months in " Egypt, were neither accuſtomed to the rains " nor to the cold, nor could they be expoſed, " with impunity, to the ſenſible varieties of the " temperature of Syria.

" The ſerene ſky and pure air of Cairo was " peculiarly invigorating and ſalubrious to the " body, which muſt neceſſarily be the reverſe in " a damp and unwholeſome atmoſphere." In addition to theſe impurities of the atmoſphere, Mr. Aſſalini further remarks, that at Jaffa, the only ſubſiſtence was rice and bad bread; the ſtock of animal food, wine, and brandy being totally exhauſted. He ſays, " I have " conſtantly obſerved, that the days on which " the ſouth weſt winds rendered the atmoſphere " *foggy*, we were ſure to witneſs an increaſe in " the number of patients and of deaths. The " contrary happened in fine clear days, when " the north winds prevailed. Damietta, Roſetta, " and Alexandria, during the autumn and the " winter, are ſimilarly circumſtanced, as we ſhall " ſee in the ſequel. Severe epidemic diſeaſes " have alſo annually appeared in theſe towns."

In reading this account, it cannot eſcape obſervation, that neither extreme fatigue, ex-

ceſſive heat, exceſſive thirſt, impure water, nor a very ſhort allowance of bad food, produced any diſeaſe like *fever:* but that as ſoon as the army was ſubjected to the influence of *humid* air, and *paludal exhalations,* this diſeaſe appeared; and that by paſſing through the deſert, the ſtate of the ſkin, and the exhauſted ſtate of their bodies in general, prediſpoſed the troops for the reception and the complete formation of ſuch a diſeaſe as the plague.

This is a clear and ſatisfactory account of the origin of the plague in Egypt. It is undoubtedly, in the firſt inſtance, an epidemic fever; but that it is alſo capable of becoming infectious is ſo well authenticated, by known, undoubted facts, that it would be ſuperfluous to repeat them here*.

Mr. Aſſalini allows, "that a perſon remaining "too long in a ſick room, breathing it's infected "atmoſphere, is in danger of contracting the "prevailing epidemic, viz. the plague," p. 11.

Again he ſays, "Some epidemic diſeaſes be-"come contagious ſolely from a number of "perſons being crowded together in one place, "and eſpecially in ill ventilated hoſpitals." Ibid.

All febrile diſeaſes become contagious by the ſame means, viz. by the accumulation of animal

* Ruſſel on the Plague, Mr. Antes's Obſervations on Egypt, Dr. Wittman's, &c.

febrilized

febrilized effluvia; an eminent example of which is now discovered in the plague itself. Moreover, the very instances of noncontagion, cited by Mr. Assalini and Sir R. Wilson, evince, that the plague is primarily uninfectious, since that freedom of intercourse, which they assert to have taken place, must have rendered many persons liable to receive the tainted breath of those, who were actually labouring under the epidemic; consequently, had it been then contagious, they must have been infected. The reader will form his opinion from the subsequent recital of Sir R. Wilson.

" The English and Turkish armies passed " through a country where the plague filled " almost every village; they communicated, " without any precautions, in the most intimate " manner with the natives; the Turks even " rifled the diseased in the pest houses of Rha- " manieh, and at Cairo dug up the corpses re- " cently buried; and yet no individual instance " of the *disease* occurred in the armies." P. 244.

Again Sir R. Wilson observes: " In Egypt, " where the villages approach within a quarter " of a mile of each other, some were exempt " from this malady, whilst the most neighbour- " ing were desolated; so common is this cir- " cumstance, that the inhabitants particularize " to Europeans those villages in their districts " which, during the season, the plague has ap-

" peared in; yet do not themſelves refuſe to
" enter into them, &c. When the plague has
" been moſt virulent in Cairo, the inhabitants
" of the citadel have often been totally free
" from any infection, although having daily
" promiſcuous intercourſe with the inhabitants
" of the city." P. 244.

" In Egypt, (ſays the report prefixed to Mr.
" Aſſalini's book, p. 7) ſituations elevated above
" the *humid* and *infectious* vapours, which hover
" over the flat plains, have been conſtantly ex-
" empt from *contagion.* Theſe vapours envelop
" the habitations, ſituate in the low grounds,
" in a thick and viſible fog, both at ſun riſing
" and at ſun ſetting. Among the places exempt
" from this evil may be reckoned the citadel of
" Cairo, the inhabitants of which were unaf-
" fected by the malady, which deſolated the
" the lower town, with which, in the interim,
" they had not ceaſed to communicate."

The inference which theſe reſpectable authors deduce from the above facts is, that the plague is not contagious. I apprehend they admit of no ſuch concluſion; but they eſtabliſh this truth, that the diſeaſe was epidemic, and had not become contagious at the times and in the ſituations to which they have alluded; indeed, the very terms in which Mr. Aſſalini deſcribes the occurrence prove, that the inhabitants of the lower town of Cairo were living under the influence

fluence of paludal effluvia, which, from his narrative, manifeſtly appears to be the great exciting cauſe of the prevailing epidemic fever of Egypt. Hence we may conclude, that all the apparent contradictions reſpecting the infection or noninfection of the plague will be eaſily reconciled by the knowledge of theſe facts, that the plague is primarily epidemic, and afterwards convertible into a contagion.

The converſion of epidemic into contagious fevers being thus, as I apprehend, clearly aſcertained, it appears to be an eſſential point previouſly to be determined, before the queſtion reſpecting the exiſtence of local contagion can be ſolved, whether any reigning malady be epidemic or contagious in the firſt inſtance. Indeed authors have too frequently overlooked this moſt material conſideration in their arguments concerning the contagious nature, or the contrary, of ſuch diſeaſes as the plague, the yellow fever, and even the typhus of temperate climes.

If I may preſume to judge from the language which authors generally uſe, when ſpeaking of theſe and other diſeaſes of the ſame claſs, the terms contagion and infection are frequently miſapplied. In order to elucidate this very important part of our ſubject, it will be proper in this place, to define what ſhould be underſtood by contagion, and to quote certain very reſpectable authors, whoſe conceptions do not exactly accord with my own, or who have not entertained

ideas ſimilar to mine. Contagion or infection, in an abſtract ſenſe, is a peculiar morbid property communicable from one living body to another, through the media of miaſms or effluvia, as they are termed, or denſer liquids*. The application of one or other of theſe to a living body induces ſymptoms exactly reſembling thoſe which conſtituted the diſeaſe whence they originated.

According to this definition, an acute contagious diſeaſe muſt be communicated by effluvia, which iſſued either immediately from a living febrile ſubject, or from ſubſtances imbued with the effluvia of a febrile ſubject, or which proceeded from the ſame ſubject within a certain period of his convaleſcence.

Fever derived from any other ſource cannot be correctly deemed *infectious*. To comprehend fully the principles on which a plan of univerſal ſuppreſſion is founded, it is neceſſary that this important diſtinction between infectious fevers, and other void of this property, be clearly held in remembrance. For without this diſtinction, the means of prevention may be miſapplied, the true origin and nature of contagion remain concealed and uninveſtigated, and the application of the term to any other exhalations or effluvia than thoſe of living *diſeaſed* bodies,

* Variolous matter, that of peſtilential buboes, the fluid of the cow pox, all which infect by inoculation ſolely.

continue

continue to add to the confuſion and myſtery in which the ſubject is at preſent enveloped. It is equally eſſential to our purpoſe, that a clear diſcrimination between epidemic and infectious diſeaſes be maintained. The former are not neceſſarily contagious, though they are capable of afterwards aſſuming infectious properties. If, therefore, the rules of prevention are practiſed where a diſeaſe is epidemic, and not infectious, they muſt be nugatory, and will fall into contempt. If they are omitted where infection prevails, and the diſeaſe is not ſimply epidemic, the moſt fatal conſequences will probably enſue.

The uſe of this diſtinction will now appear in it's full force; and I ſhall therefore proceed to ſhow by quotations, that the difference between contagious and epidemic fever has not been practically adverted to, nor the converſion of one into the other, if known, diſtinctly promulgated; and that the terms contagion and infection, if clearly underſtood, have not been uſed in that appropriate ſenſe, which is neceſſary to the elucidation of ſo myſterious a ſubject.

From the accurate relation, which the ingenious Dr. Currie gives in his Medical Reports of the origin of the epidemic, and (as he adds) contagious fever, which broke out in the 30th regiment at Liverpool, it appears to me extremely doubtful whether it was not ſolely excited by the pyrexial effluvia, which iſſued from

the *cellar*, under the guard room, or the ſurrounding paludal atmoſphere; and it appears to me very probable, that all the individuals, who were attacked with typhus, ſuffered epidemically and not by contagion. Let us attend to the account.

" The general guard room had been uſed, " previous to the arrival of the 30th regiment, " as a place of confinement for deſerters; it was " extremely cloſe and dirty, and under it was " a *cellar, which in the winter had been full of* " *water; this water was now half evaporated, and* " *from the ſurface iſſued offenſive exhalations.*" P. 10. Theſe, in my opinion, were the cauſe of the typhus, or jail fever, in this inſtance, " which appeared in two men, who had been " confined in a dark, narrow, unventilated cell " off the guard room." P. 9. By the timely and conſummate ſkill of Dr. Currie, the epidemic was not permitted to become contagious.

" Our firſt care (ſays he) was to ventilate and " clean the rooms," &c. p. 11; which, I preſume, together with the ſucceſsful reſult of ablution, put a ſtop to it's converſion into infection.

" Our next care (continues the Doctor) was " to ſtop the progreſs of infection; with this " view, the guard houſe was attempted to be " purified by waſhing and ventilation, the " greateſt part of it's furniture having been " burnt or thrown into the ſea. All our pre-

cautions

" cautions and exertions of this kind were how-
" ever found to be *ineffectual*. The weather
" was at this time extremely cold for the ſeaſon;
" the men on guard could not be prevailed on
" to keep in the open air; and, from paſſing
" the night in the infected guard room, ſe-
" veral of the privates of the ſucceſſive reliefs,
" on the 10th, 11th, and 12th of the month,
" caught the infection." P. 12. I ſhould ſay the epidemic from their expoſure to the paludal gas.

" Again; no means having been found ef-
" fectual for the purification of the guard room,
" it was ſhut up, and a temporary ſhed erected in
" it's ſtead. Still the contagion proceeded; on
" the morning of the 13th, three more having
" been added to the liſt of the infected. On
" that day, therefore, the whole regiment was
" drawn up at my requeſt, and examined in
" their ranks: ſeventeen were found with ſymp-
" toms of fever upon them." P. 12.

Theſe means were ſucceſsful in arreſting the epidemic; after the 13th, no perſon was attacked by it: it extended to fifty-eight perſons in all. Dr. C. uſes the terms epidemic, contagious, and infectious, all in one ſenſe, which evidently proves, that he had not the idea of epidemics being converted into a contagion, or of eſtabliſhing a diſtinction between them; that, although ſeveral men were found to be affected on the day after the guard room was cloſed, they were

were all, moſt probably, affected by the limoſe exhalations from the cellar. It is reaſonable to conclude, that all the ſick had, in their turns, when on duty, been ſucceſſively expoſed to them; and the interval between the expoſure of the laſt men who ſickened, and the cloſing of the guard room, was ſufficiently ſhort to account for the ſickneſs of thoſe who were ſeized after the excluſion from it. It appears alſo, in confirmation of my preſumption, that the ordinary means by which *infectious miaſmata* are deſtroyed, were, in this caſe, *fruitleſs*; conſequently, that a really *infectious* ſource of fever did not there exiſt.

"The main danger from *fever*," Dr. Blane obſerves, "does not ariſe, as in ſmall-pox, from "the infection generated in the *courſe* of the "*diſeaſe* itſelf, (which is ſo trifling that the "reality of it has been queſtioned) but from "what has been contracted from the ſtagnated "and corrupted effluvia of the living human "body, in the abodes of filth and confined air, "ariſing, in the firſt inſtance, independent of "the exiſtence of fever. The only real danger "to be apprehended, is from the poiſon adhering "to the perſons and clothes of thoſe who are "newly brought into the hoſpital." P. 49.

The fever which does not ariſe from infection generated in the courſe of the diſeaſe, certainly is not infectious, neither do the ſtagnated, &c. effluvia

effluvia generate infection; the fever originating from them is ſimple fever, an epidemic and not contagious, if many are expoſed to the ſame effluvia for a given time only; neither are the clothes infectious in this primary ſimple fever. Dr. Blane goes on to obſerve, "that he has "met with innumerable examples that the *infec-* "*tion* of *fever* is *originally generated* and *pro-* "*pagated* without the *exiſtence* of *fever*."

Such a fever is an epidemic; infection has no connexion with it, and is here inaccurately introduced. Again, "Theſe fevers, when they "do exiſt, will not communicate infection, ex- "cept in circumſtances of the groſſeſt neglect, "in point of cleanlineſs and ventilation." P. 47. Clark's Collection.

Theſe are the preciſe circumſtances which convert ſimple epidemic fever into infectious; and I have the reſpectable, though unconſcious teſtimony, of Dr. Blane, in ſupport of this curious fact.

The ſources of epidemic, or ſimple paludal fever, and contagious fever, are here blended together, and all the paſſages are rendered difficult and obſcure, by the miſapplication of the word infection.

I ſhall endeavour to render this intereſting part of the inquiry more intelligible, by a plain example.

It is an undoubted fact, that paludal or limoſe gas induces fever. A number of perſons, whether

whether in a private dwelling, a priſon, a ſhip, or a camp in a marſhy diſtrict, being expoſed to the operation of this gas, all become affected with ſimple or idiopathic fever, which happening to more than one, for this reaſon is ſtyled epidemic. One of theſe febrile patients is removed into an airy dry ſituation, where cleanlineſs and ventilation are ſtrictly attended to; neither the cloſeſt approach to this patient, nor the reception of his breath, is infectious; nor are his clothes imbued with miaſms of this character. But remove either one or more of the family, crew, or priſoners, who have become feveriſh from the ſame cauſe, into a cloſe, unventilated apartment, or crowded hoſpital, or ſuffer them to remain in their original ſite, where the fever commenced, without the advantages of cleanlineſs and ventilation, &c.; then their fever will aſſume the contagious character; their clothes, bedding, &c. deriving the ſame properties from the ſame cauſe. The pyrexial gas formed in theſe circumſtances becomes *aniſmaliſed*, or *capable* of *propagating* it's *like*, and then only, for the firſt time, becomes infectious. It has been proved, that the accumulation of *human* effluvia, where fever is not preſent, induces convulſion, and not fever*. We may venture to conclude, that human effluvia muſt be febrilized previous to their becoming infectious,

* See page 121.

conſequently

conſequently no infectious fever can ariſe, but through the medium of a febrile body. In the practice of prevention, the diſtinction here deſignated, will ſhow how fevers may be prevented from becoming infectious; and by attending to the peculiar circumſtances which occaſion ſimple, and thoſe which excite contagious fever, in ſpecific inſtances, a certain criterion may be immediately formed, indicating when one, and when the other is preſent, and meaſures may be taken more readily correſponding with the nature of each, than when the origin and names of the two fevers are confounded and blended together.

The character of the fever, which animal contagions and paludal gaſes induce on a human body, unaffected with inflammation, congeſtion, or any local diſeaſe, is that of *typhus* *. This character retains it's influence, uniformity, and identity over the whole claſs of acute contagions; probably from the ſeat of it's impreſſion being chiefly the brain and nerves. But the peculiar ſymptoms, which entitle them to the appellation *ſpecific*, commonly ariſe from accidental inflammation, or other affections, local or general; then their character becomes compound, and their moſt appropriate title is that of *ſynochus*.

The exiſtence, and the ſources of pyrexial gaſes, being, in my opinion, unqueſtionably

* By typhoid fever, I mean all fevers attended with great debility, dejection, and feeble pulſe.

proved,

proved, we have great reaſon to believe, that the portion of the human frame on which they principally operate is the brain and nerves, and through this medium, on the heart, the arteries, and the organs of ſecretion, more or leſs generally, throughout the whole frame. Diſeaſed ſenſation, rigors, univerſal ſoreneſs, ſevere erratic pains, particularly of the head and loins, vertigo, delirium, ſubſultus tendinum, ſtupor, coma, more or leſs collectively, and in various degrees, accompany all acute contagions, and evidently point out the original and primary ſeat of impreſſion to be that of the brain and nerves. We have already adduced particular and ſtriking inſtances of this fact*.

Both paludal and human effluvia produce fever of the ſame ſtamp and character in proportion to their degrees of concentration or dilution; they are both ſubject to deſtruction from ſimilar cauſes, and the only diſtinction between them ſeems to conſiſt in the power which contagious, or human effluvia, have, to tranſmit to other perſons peculiar ſtates of the body, in conjunction with febrile actions; which curious and myſterious circumſtance ſtrongly induces us to conclude, that their parent ſtock and general influence is alike in all; but the ſpecific appearances, or various forms of all infections, may have been originally adventitious or accidental.

* Page 71, ſupra.

That

That ſtate of the human body, termed febrile, however various in it's degrees, ſeems to be conſtantly aſſociated with thoſe contagious diſeaſes which I have termed acute. But two circumſtances are eſſential to the formation of fever, a peculiar condition of the body, and it's expoſure to certain external circumſtances, commonly ſtyled remote and occaſional cauſes. It will not be denied, that the condition of the body, at the time when it is attacked with fever, muſt greatly influence or vary the form of that diſeaſe which is about to become contagious, while the febrile actions themſelves, and the remote and proximate cauſes of thoſe actions, may retain an uniform and identical character. The cauſes which determine one contagion to aſſume a puſtulary form, as ſmall-pox; another, a bubonary, as the plague; a third, an eryſipelatous, as ſcarlet fever, &c., are ſubjects of important inquiry, which have hitherto been very inſufficiently inveſtigated. I ſhall ſlightly touch upon them at preſent, for the ſake of illuſtration, and of exciting diſcuſſion, rather than from any ability to form poſitive concluſions; but more eſpecially, that by attempting to ſeparate what is incidental from what is permanent, in the character of acute contagions, our views of theſe important diſeaſes may be more clear and correct, their cauſes rendered leſs myſterious and obſcure, the means of their prevention or their treatment more evident, more readily underſtood,

and

and of more eaſy adoption. I ſhall ſelect the ſmall-pox, as my firſt example. From Mr. Denon's Travels in Egypt, we find, in the following quotation, a very plauſible origin of the ſmall-pox, though it is not introduced by him with any view to ſuch an application.

"The heat had become inſupportable, the weſt "wind oppreſſed us, cauſed bleedings of the "noſe, and painful eruptions, which covered, "alternately, all parts of the body, dried and "hardened the ſkin, and impeded perſpiration. "The rays of the ſun, the principal, perhaps the "ſole cauſe of theſe evils, raiſed on every pore "a puſtule, ſimilar to the ſmall-pox, which be-"came intolerable, when, in lying down, it was "neceſſary to reſt on theſe points." Denon, vol. II, p. 179. Aikin's tranſlation.

We have here, in my opinion, the origin, outline, and external form of ſmall-pox, exactly depicted, before it's converſion into a contagious peſt.

Mr. Denon and his fellow travellers ſuffered much pain, and were greatly annoyed, but they were not expoſed, at that period, to the remote cauſes of fever. Had they been the firſt who experienced this puſtular affection above deſcribed, unattended with fever, they could not have communicated that external ſtate of the body to others. In all inſtances of primary, original contagion, and every contagion muſt have had an origin, in one or more individuals, it

ſeems

ſeems eſſential that certain actions ſhould take place in the animal body, by which the poiſon muſt be generated which is about to be infectious, and which being received into another animal body, communicates the ſame form externally, and excites actions internally, ſimilar to the primary one in the original ſubject; theſe actions are indiſpenſable to the formation of the contagious principle, and whenever they are perceptible, aſſume the febrile character.

Although febrile actions are always inſtrumental in reproducing contagious gaſes, and moſt generally contagious pus or matter, there appears to be one great exception in the inſtance of vaccinia. This diſeaſe differs from the general inſtances of contagious effects, in the external mildneſs of conſtitutional affection or impreſſion on the brain and nerves; ſo mild as not commonly to excite perceptible febrile actions, and hence it is more than probable it's inaptitude to be propagated by infectious effluvia ariſes, which, in this ſingular and happy inſtance, are not even formed. But, although in ſome inſtances of ſmall-pox, and in all of vaccinia, the conſtitution may be impregnated with a ſpecific contagion, and may aſſimilate and reproduce contagious matter, without undergoing perceptible, or great degrees of fever; nevertheleſs, a conſtitutional change muſt take place, or the aſſimilation of the infecting fluid be actually com-

pleted, however mildly, before the ſubject can communicate identical infection to another, or be itſelf ſecured from a future attack of the ſame. This great exception, therefore, is only ſuch in appearance; it does not, in reality, deduct from the univerſality of mode in which infection operates, it proves more ſtrongly than could have been imagined, the great difference of degrees in which impreſſions may be made; it is in agreement with all the facts known on this ſubject, tending to ſhow, that ſuſceptibility to, and the conſequences of infection, ſubſiſt in every gradation, from the moſt obvious and violent to the moſt minute and imperceptible. Vaccinia itſelf is, in many inſtances, attended with ſlight febrile actions, ſo that when the reſult of conſtitutional impreſſion is evident, it aſſumes *the febrile* character. The conception I have formed, on apparently fair reaſoning and ſubſtantial facts, that acute infection can only be imparted through the medium of febrile actions, which animaliſe, or confer the faculty of propagating their like, on certain gaſes and fluids generated by the living animal, ſeems to throw conſiderable light on this obſcure ſubject. Specific contagions may, on this idea, be tranſmitted, propriâ formâ, from one ſubject to another, on ſimilar principles with which hereditary diſeaſes, peculiar conſtitution, ſimilitude of temper and perſon, are conveyed from parents to children.

children. The proceſs of previous animalization is equally inexplicable in both: the exerciſe of the natural functions ſuffice for the ordinary purpoſes of tranſmiſſion; increaſed actions ſeem to be eſſential to ſpecific febrile propagation.

A perſon under this puſtular affection*, being expoſed to the cauſes which produce infectious fever in him, would become capable of communicating a diſeaſe named ſmall pox, to a ſecond perſon receiving the effluvia of his body; and a third perſon being inoculated with matter taken from his puſtules in a due ſtate of maturity, would alſo be infected with the ſame diſeaſe. We ſee clearly, that the local affection or external form of a new diſeaſe may be eaſily acquired on expoſure to new and peculiar external impreſſions; but it is extremely wonderful, that a new diſeaſe ſhould, in the ſecond inſtance of it's exiſtence, as well as in every future example, retain the preciſe form in which it originally appeared on the perſon firſt affected by it; ſuch, however, is the fact. The ſmall-pox has retained it's original form, in paſſing through millions of victims, and under all the varieties of climate where it has appeared. If this origin of the ſmall-pox be entitled to any degree of credibility or likelihood, it's puſtulary form is proved to be adventitious, while the attendant

* Page 144.

febrile actions will be found on compariſon to bear the typhous ſtamp and character of other acute contagions, and moſt probably may claim a remote cauſe, ſimilar or identical with theirs*.

Purſuing the ſame track of inveſtigation, we ſhall probably diſcover why the plague aſſumes a *bubonary* form. The exceſſive heat of the climate in Egypt, and it's propinquity, in many parts, to ſandy deſarts, and the expoſure of it's inhabitants, and ſtrangers or travellers, to the hot parching winds, which blow over them at certain ſeaſons of the year, induce a peculiarly dry, irritable ſtate of ſkin, and impeded perſpiration. When perſpiration is impeded, increaſed abſorption takes place, and the lymphatic glands become diſtended and irritable. The cutis, deprived of it's moiſture, becomes parched, and ſuſceptible of that inflammation which may be ſtyled carbuncular, ſpeedily terminating in mortification †.

The

* Sir John Pringle, p. 193.

† The ſtate of ſkin here alluded to, previous to febrile attacks, is not an imaginary ſtate. I cite the following from Dr. Wittman, one of the lateſt ſcientific travellers through Egypt: "The great heats which prevailed at this time "were productive of prickly heat, painful puſtular eruptions "of the ſkin, boils, and other ſimilar complaints. The bites "of the gnats, moſquitoes, and other inſects, became inflamed, "and produced very troubleſome ſuppurations." Dr. Wittman, p. 329. Dr. W. repeatedly mentions the Kampſin wind,

The intimate connection between the ſkin and lymphatic glands is well known, by various morbid affections, to exiſt in every climate. An Egyptian, or any individual, being expoſed to paludal gas, and attacked with fever, in this irritable ſtate of ſkin and lymphatic glands, or when both are actually diſeaſed, will be ſaid to ſuffer the plague in his own perſon, and if ſubjected to the circumſtances which generally render fevers contagious, will communicate a diſeaſe of a ſpecific form to a ſecond individual receiving his effluvia.

The caſes of plague which Dr. Ruſſel deſcribes under his fifth claſs, appear to me not to merit that character, but to have been the common cutaneous and glandular affections ſo frequently obſerved in countries ſituate as Egypt is. "To "this claſs," ſays he, "are referred caſes of "ſlight infection, wherein the *more formida-* "*ble peſtilential ſymptoms never concurred,* and "all the infected recovered. The acceſs here "was often attended with ſo little apparent diſ- "order, that the eruptions gave the firſt alarm, "and the fever, which came on afterwards, was "frequently ſo ſlight as not to confine the ſick "to the houſe. Others found themſelves in- "diſpoſed two or three days, but were not ſen-

wind, during the march of the Turkiſh army from Joppa to Cairo, as a very prevailing cauſe of diſeaſed ſkin, debility, &c.

" ſible of any febrile heat whatever." Ruſſel, p. 110.

It is evident, that the external affections were here the ſole diſeaſe, and that this was merely ſuppoſed to be the plague, becauſe thoſe who are ſeized with the endemic fever of Egypt and Syria, more frequently exhibit theſe eruptions, than not. But the ſame ocular witneſs, and accurate hiſtorian of the true plague, whoſe teſtimony is undoubted, aſſures us, that theſe adventitious marks of plague are frequently abſent, and points out the evil conſequences of confiding in their appearance, as invariable characteriſtics of that direful diſeaſe, in the ſubſequent paragraph.

" That the plague, however, under a form, " of all others the moſt deſtructive, exiſts *with-* " *out* it's characteriſtic eruptions, or other ex- " ternal marks reckoned peſtilential, can admit " of no doubt; and it is to be regretted, that " mankind have ſo often, from the abſence of " theſe, been betrayed into errors of fatal con- " ſequence on it's firſt invaſion; at which early " period, human prudence can only be exerted " in the way of public defence, with any pro- " bability of ſucceſs." Ruſſel, p. 99.

In theſe inſtances the plague aſſumes the ſimple character of typhus. Carbuncles, which are another characteriſtic of plague, own a ſimilar cauſe with buboes, and are equally incidental.

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The bubonary form of the plague is plainly proved to be adventitious. It's genuine character is undoubtedly *typhal*, and it's origin decisively traced by Assalini, Sir R. Wilson, &c. to the operation of paludal exhalations. But though, as an epidemic, it may exist without it's specific concomitants, and may become contagious as a simple but malignant typhus, yet the bubonary, like the variolous fever, being once formed in the primary subject, is specifically transmitted in that original shape, to a second or third, or millions of persons; not only on the spot, where a conjunction of circumstances gave it birth, but to other climes and regions, where such united influence does not exist.

The exterior forms of the yellow and scarlet fever are not less incidental than those of the plague and the small-pox; neither the scarlet suffusion, nor the yellow tinge, are constantly present, when these fevers prevail, although they derive their name, and are supposed to possess their respective specific character from the adventitious circumstance of colour. That the red efflorescence in scarlatina is an incidental occurrence; that it's character is that of typhus; and that the frequently attendant angina is the essentially dangerous symptom, perhaps the original and primary form of the disease, has already been proved*. Although it's origin can-

* Page 48, & seq.

not be ſo diſtinctly traced as that of it's brethren, it poſſeſſes features ſufficiently marked to demonſtrate it's proceeding from the ſame ſtock. The yellowneſs, which is ſuppoſed to characteriſe a peculiar fever, is found, on the beſt authority, to be frequently an adventitious ſymptom; at the ſame time that it's origin is ſhown to be paludal, and it's *unmixed* complexion truly typhal *. But it muſt alſo be obſerved, that, according to the principles I have endeavoured to eſtabliſh, and in agreement with the laws which are known to influence the peculiar form of other ſpecific contagions, the diſeaſe termed *Yellow Fever* may, in like manner, be tranſmitted, propriâ formâ, from one perſon to another, or be converted into a ſpecific infectious fever. Hence the advocates for it's contagious influence may be as correct, in ſome inſtances, as thoſe who maintain a contrary opinion, may be in others. The controverſy being thus compromiſed on ſcientific grounds, the advocates on either ſide, will, I truſt, unite their labours and talents in diſcovering *when* it is *infectious*, and *when* it is *epidemic*. As, in the firſt inſtance, it's fatal progreſs may be timely prevented; in the ſecond, it's ſources deſtroyed.

* Lommius Obſervationes Medicinales. p. 7. Sir J. Pringle, p. 24, 31, 172, and pages 197, 198. Dr. Huck, in loco. Dr. Lind on Hot Climates, p. 127, 128, 130. Mr. Henderſon. Dr. Fowle.

Meaſles

Meaſles ſtrictly belong to the claſs of epidemic catarrhs. The eruption has, moſt probably, been incidental in the primary ſubjects, previous to it's converſion into an infectious diſeaſe; and it's ſource may be traced, like that of variola and peſtis, to the concomitant phenomena of fervid climes. "The French army," ſtated to be then in moſt perfect health, "on it's arrival at Alex-"andria, was received on a parched and burn-"ing ſoil: the thermometer, at noon, 26° of "Reaumur, the nights ſeverely cold; but the "immenſe number of moſchettoes diſturbed it's "repoſe by punctures, which inflamed the ſkin "like the eruption of the meaſles." Introduction to *Obſ. ſur la Peſte*, &c. Aſſalini, p. xxii.

Catarrhal affections, of which the mucous membrane of the noſe, the larynx, the trachea, and bronchial veſſels of the lungs is the true ſeat, are cauſed by the ſudden alternations of the heat and the cold, the dryneſs and the moiſture of the atmoſphere, and they occur in hot climates, where theſe changes are extreme, as well as in the temperate and frigid regions of the globe. Hence they are as frequent in Egypt as elſewhere. An individual labouring under catarrhal affection, and accidentally covered with the punctuary eruption deſcribed by Mr. Aſſalini, being ſeized with typhus fever, would originate that peculiar contagion called meaſles, which would be propagated in that individual

ſhape,

ſhape, according to the laws eſtabliſhed in other contagions, which are equally curious and inexplicable.

The morbillous fever, therefore, moſt probably belongs to the tribe of typhus, and being very likely the offspring of a hot climate, it's character may be ſomewhat modified in others more cold; and it is alſo probable, that the not unfrequent occurrence of pneumonic ſymptoms are moſtly adventitious, and induced by accidental expoſure to cold at the time of the eruption.

All ſimple catarrhal affections, ſuch as are commonly ſtyled influenzas, are moſt generally, if not always, attended with great debility. They appear to me to originate from a moiſt foggy ſtate of the atmoſphere, acting on bodies heated by artificial temperature, or by the preceding warmth of the external air. Their genuine character is that of typhus. Inflammation of the cellular ſubſtance of the lungs and of the pleura is frequently ſuperadded, or may precede epidemic catarrh in individuals, but ought not to be included as an idiopathic ſymptom of ſuch diſtempers. This important diſtinction ought to be ſtrictly maintained in our inquiries concerning the origin, nature, and properties of influenzas or epidemic catarrhs. The ſame precautions are neceſſary to prevent their converſion

into

into an infectious diſtemper, as are required in other epidemics.

The late influenza is an inſtance of a true catarrhal epidemic, the ſeat of which was the mucous membrane of the trachea arteria and the bronchial veſſels; it did not appear to me to be contagious in any one inſtance, and retained it's ſimple character within the circle of my obſervation. Expoſure to pyrexial gaſes and the generative cauſes of infection might, or may have, converted it in ſome caſes into a contagion, but I have heard of no ſuch inſtances ſpecifically traced.

Having, I preſume, rendered the four preceding poſitions highly probable at leaſt, I proceed next to the 5th, or ultimate and moſt important concluſion, towards the eſtabliſhment of which all the previous facts and reaſoning were intended to contribute.

5th. *The ſole ſources whence typhus fever are actually derived being made thus evident, and the cauſes which render it contagious, being clearly developed, and ſhown to admit of prevention: it follows, that the univerſal ſuppreſſion of every febrile contagion is completely within the power of civilized nations.*

If the cauſe and origin of infectious fevers prove to be really ſingle and identical in a great majority of inſtances, how greatly is the facility of extirpating this fertile ſource of calamity and death

death increaſed and promoted? The means of prevention cannot fail to appear, from the preceding diſcuſſion, to lie much more within the precincts of human control than could have been concluded *a priori*, conſidering the extent, the magnitude, and the multiplying power of ſuch evils. Preventive meaſures, executed on that grand and comprehenſive ſcale, which the preceding view of the ſubject renders feaſible, and which is calculated to annihilate univerſally the ſeeds and germes of acute infections, moſt happily coincide with the improvements in agriculture and cultivation, which ſo eminently diſtinguiſh the preſent æra. Theſe meaſures are alſo ſtrictly connected with the preſervation of the lives of thoſe valuable men, who are employed in the promotion of commerce, of colonization, and the not leſs urgent operations of war in every portion of the globe; but more eſpecially in the ſettlements, harbours, and ſeaports, the foreſts, lakes, and moraſſes of fervid climes. All theſe ſituations, inſalubrious and deſtructive chiefly from one cauſe, which is generally removable by human induſtry, might furniſh ample employment for convicts of various deſcriptions; thoſe who have forfeited life being deſtined to the moſt dangerous part of ſuch ſervices. By the univerſal conſent of all civiliſed governments, ſeaſons of warfare between individual nations not being excepted,

this

this useful employment might be allotted to the unfortunate criminals of all countries, in every part of the world, where their labours can contribute to the beneficent end here proposed.

This idea is humbly, though earnestly, advanced, with the hope, that the legislature of my native country will be the first to give some attention to it. I feel, too, a confident expectation of rousing the exertions of benevolent and ingenious men at a season, when the means and the inclination to effectuate improvements are more abundant than ever, and when a spirit of genuine philosophic research not only exists, but is actually applied to the most humane, enlarged, and liberal purposes.

The seasons when pestilential diseases most commonly infest particular districts, which often visit the same annually, being already known, or capable of being accurately observed, should be carefully registered among every cultivated people, their approach guarded against, as far as human means and foresight can avail, and measures of precaution recommended or enforced by the legislature, and executed by committees or boards of health in all civilized nations. Those measures, which render seasons less injurious or totally innocuous, are such as regard the nature and qualities of the soil where habitations are placed, much more than the temperature of the atmosphere, and are con-

conſequently more within the compaſs of manual exertions.

"The climate of Trincomale has alſo been "looked upon as the hotteſt and moſt unhealthy "of the whole iſland; and both the 72d and "80th regiments ſuffered ſeverely from it on "their firſt arrival. Theſe noxious qualities of "the climate were owing, in a great meaſure, to "the woods and marſhes, which came up to the "very fort, and which the Dutch had never ſuf-"ficient policy or public ſpirit to remove. Since "the place has been in our poſſeſſion, a very "proper ſyſtem has been adopted, to render the "climate wholeſome. Colonel Champagne, "while ſtationed here with the 80th regiment, "cleared a large tract of ground, in the neigh-"bourhood of the fort, of the jungles, with "which it was covered; and alſo drained ſeveral "of the ſwamps and marſhes. The good effects "of theſe improvements have already been ex-"perienced, and the European garriſon has ſince "ſuffered very little from the climate*."

Theſe primary modes of prevention conſiſt in clearing away or ventilating jungles, woods, and foreſts, and cultivating the grounds which they covered†. In draining extenſive, outly-

* Percival's Ceylon, p. 43.

† This circumſtance of ſubſequent cultivation is abſolutely neceſſary, as appears by the previous quotation from Morſe's Geography.

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ing ſwamps, moraſſes, and marſhes, and thoſe which lie in the vicinity, and taint the atmoſphere of cities, towns, or villages. The ventilation of priſons, hoſpitals, ſhips, and manufactories is much more practiſed than formerly: but a more ſtrict attention to paving the ſtreets of many principal populous towns and great cities, covering the drains, ſhores, wells, and ditches of the ſame, as alſo thoſe of priſons, hoſpitals, manufactories, barracks, and garriſons, is ſtill greatly wanted.

The habitations of the poor and needy ought to be more ſtrictly attended to, not only with regard to cleanlineſs and ventilation, but alſo reſpecting the *ſituations* where they are built, and the *manner* in which they are conſtructed. No human being ought to inhabit cellars or chambers under ground; it belongs to the humanity of landlords to regulate this matter, or it ought to become an object of police where life and health are ſo certainly endangered.

The law obliges the builders of all houſes, erected within a certain period, to raiſe a party wall, as a ſafeguard againſt the communication of fire from one dwelling to another. An excellent plan has been contrived by Sir G. Paul*, and executed in the conſtruction of the Glouceſter Jail and Infirmary, which includes

* Tranſactions of the Society for the Encouragement of Arts, &c. vol. xix, p. 299.

three

three very great advantages—an improved mode of ventilation—a proper degree of temperature —and a complete exemption from humidity, or moiſt unwholeſome exhalations. As contagious diſeaſes are more deſtructive of life in the preſent ſtate of this country than accidental conflagration, ought not the plan alluded to, or one ſimilar to it, be legally enjoined in the conſtruction of the contracted dwellings and tenements of the humbler claſs of artiſans and labourers in the neighbourhood of manufactories, or in the narrow confined ſtreets, lanes, and alleys of populous towns?

In the accounts of the origin of contagious fever in Mancheſter, Liverpool, Newcaſtle, &c., we find, that the unhappy families who ſuffer from this calamity, are very commonly taken out of cellars*, damp ground floors, and unpaved courts or paſſages, where humidity, mire, and filth abound.

The diligent and frequent removal of mud, ſlime, and mire, is likewiſe a very eſſential mode of prevention, which has hardly attracted the notice of thoſe, who have humanely endeavoured to correct ſimilar nuiſances.

* The inhabiting of cellars, in which a conſiderable proportion of the lower claſſes dwell, immerſed in darkneſs damps, &c., ought to be regulated, if not prohibited. Stanger's Remarks, &c. p. 26.

Both

Both in the internal regulations and external ſite of all the abovementioned ſtructures and in all populous diſtricts, humidity ſhould be anxiouſly obviated by every poſſible contrivance. In all thoſe inſtances, where migration from damp, low, moiſt ſituations is impracticable, where buildings crowded with inhabitants have been eſtabliſhed in inſalubrious ſituations; where alſo the preceding meaſures of draining, ventilating, drying, and removing noxious ſoils are found to be only partially, if at all capable of adoption, receptacles, ample, airy, and dry, both internally, and, in point of ſituation, externally, ſhould always be conſtructed within a proper diſtance of ſuch habitations, to admit the ſick at the firſt commencement of a diſeaſe, which is liable to become contagious.

Some of theſe are already prepared in the metropolis, and in ſeveral parts of the kingdom. We may hope, that in due time, houſes or wards of reception will be eſtabliſhed *wherever* they are wanted; and that they will be ſo contrived as to admit every ſpecies of acute contagion.

In laying out plans, and chooſing the ſite of new cities, towns, ſea-ports, and all public erections intended for populous crowded reſidence and reſort, every ſource of morbific exhalations, which have been ſo plainly pointed out, will, I ſincerely hope, be ſacredly avoided.

Since warfare appears to be the inevitable and unceaſing ſcourge of mankind, whether in the barbarous or civilized ſtate, ſince diſeaſe deſtroys greater numbers than the ſword in the modes in which war is unavoidably conducted, and the preeminent cauſes of ſickneſs are contagion and expoſure to pyrexial gas; theſe ought to be obviated by every effort, which a diſtinct and perfect knowledge of them can now enable the rulers of nations and the leaders of armies to adopt. Every rule applicable to the choice of ſite for encampment in point of dryneſs, cleanlineſs, and other cauſes of ſalubrity, ought to be attended to in the ſoldiers' march with unremitting vigilance and anxiety. In the temperate, but more eſpecially in the torrid climates, no effort or coſt ought to be withheld in ſecuring the health of troops in their regimen, encampments, field and other hoſpitals, garriſons, and barracks. Humane arrangements ought alſo to be adopted by powers at war for the mutual accommodation of the ſick and wounded of each contending army in every poſſible ſituation, which more rapid or tardy evolutions create. Theſe might be the baſis of a new and ſacred law of nations, to diminiſh, if poſſible, the inevitable horrours of war, and check the unneceſſary and profuſe waſte of life. A ſcandalous inattention to theſe crying demands on humanity continually occurs in the records of

of naval, military, and medical hiſtory down to a very recent date. Ignorance might be the plea of our predeceſſors, but it cannot be that of the preſent age.

The origin of any particular epidemic ought to be inveſtigated at it's very commencement, whereſoever that may take place; and if any ſource of pyrexial gas be diſcovered, which can not be deſtroyed, removal from it's operation is the only mode of extinguiſhing the epidemic at it's birth, and preventing the ſeeds of infection from being even ſown. This prime eſſential meaſure cannot be too impreſſively recommended, it's importance too religiouſly weighed, or the inſtruction it yields too zealouſly acted upon. When an epidemic diſeaſe has actually eſtabliſhed itſelf, it muſt be fully underſtood, that if the ſource is not diſcovered in it's outſet, it will be very difficult to unveil it afterwards, when contagion is alſo probably added to it; and when, conſequently, the two pyrexial gaſes are acting in conjunction.

The united influence of paludal and contagious gaſes muſt therefore be included in the inquiry into the infectious nature and origin of any prevailing epidemic; and this inquiſition muſt be perſevered in, or, if omitted at firſt, inſtituted though late; becauſe, from fatal experience, it is now well known, that no treatment can ſucceed ſo happily, as when the ſick can be removed from the

the influence of these poisonous vapours; or any preventive means made effectual, unless the exclusion from the influence of both be complete.

A very brief address to my medical brethren shall conclude these pages.

The duties of a physician, if strictly performed, are at all times hazardous, painful, and arduous; but most particularly so during the reign of malignant, epidemic, and contagious diseases. He is therefore entitled to the most candid construction of his mode of practice which the public, and his professional compeers, who are placed at a distance from such scenes of sorrow and agitation, can possibly bestow. The fatigue of thinking on every individual case is so great, where a multiplicity occurs, that practitioners have eagerly sought after compendious rules, which greatly diminish their labours, and which are thought to be particularly applicable to epidemic and contagious diseases, where similarity of symptoms so generally prevails. The desire to lay down these laws of practice is as seducing as the inclination to adopt them. But it is to be feared, that numerous lives have been sacrificed in attempting to establish and to act upon practical rules, which were designed to meet the exigency of every case. This, in my opinion, has been a great errour in the treatment of these naturally destructive diseases. I trust, that it will henceforward be assi-

duously

duouſly avoided, and that medical men will be convinced, that they cannot be too cautious in the adoption of general rules, or too attentive to the peculiarities of individual patients.

Although the invariable effect of human and paludal pyrexial gaſes be to diminiſh the powers of life, and induce the greateſt degree of debility, yet a more dangerous rule could not be adopted than to treat every patient indiſcriminately on a highly tonic plan, in probable oppoſition to this cauſe, while none could be more diſaſtrous than to purſue in all inſtances a contrary courſe. While the ſcientific, experienced phyſician will be reſtrained from entering on raſh extremes of practice on any occaſion, he will be particularly circumſpect during the ſeaſons of prevailing ſickneſs and calamity; and he will not ceaſe to reflect, that men, ſuddenly expoſed to the impreſſion of a widely extended cauſe of ſickneſs, muſt be ſeized by it under every variety of conſtitutional ſtate and actual diſeaſe; whence muſt ariſe great variety of ſymptoms, which will require peculiar treatment, and to which no general mode of practice can poſſibly be made to apply.

Inſtances of this nature muſt have occurred to every phyſician of reading and obſervation, and it will therefore be unneceſſary to particularize them in this place. Such will readily admit the abſurdity of laying down any one particular mode

of practice, and the neceſſity of exerciſing his own judgment, on innumerable occaſions, to the utmoſt extent of his mental faculties. By always acting up to this conviction, he will then, and then only, have fully performed his DUTY.

" Nam multis fatius eſt *compendia quædam* " medendi quærere, et his cumulare opes atque " miſerorum cædes miſcere, quam longe ſudo- " ribus indefeſſaque mentis intentione morbos " ſtudere, cognoſcere, atque æſtimare, ac tum " primum his ipſis incolumi conſcientia auxi- " liari." Lommii Epiſtola ampliſſimo Ordini Senatorii Reipubl. Bruxellanæ.

THE END.

[Printed by Bye and Law, St. John's Square, Clerkenwell.]